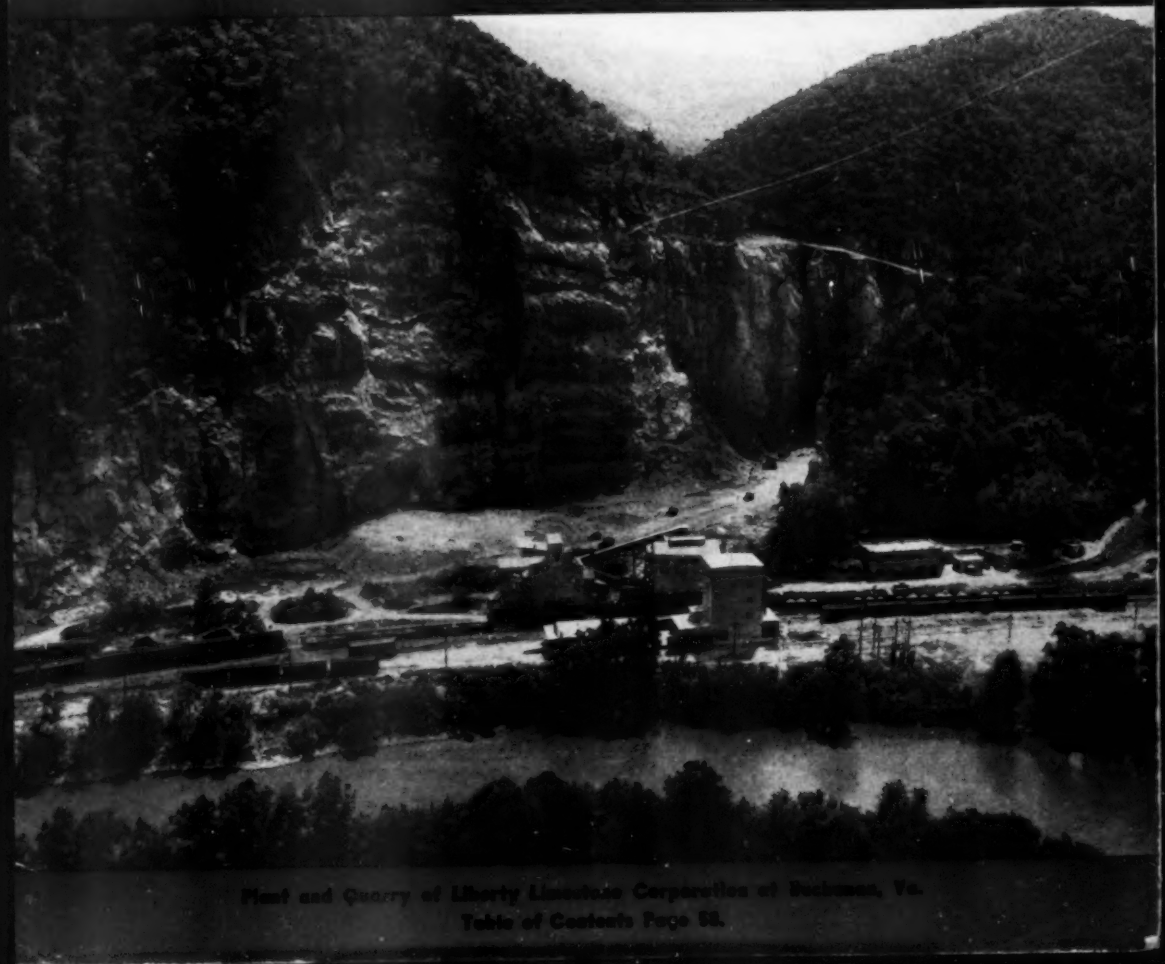
PIT AND QUARRY

SEPTEMBER 1951

In this Issue . . .

Suspension at Ada Plant of Ideal Cement • Productive Maintenance • Dillon-Sharpe's New Setup • Buffalo Cr. Stone, Brooks Plants • World-Wide Cement Review • Direct Drives for Grinding Mills • The Law of Grading for Concrete Aggregates



Plant and Quarry of Liberty Limestone Corporation at Buchanan, Va.
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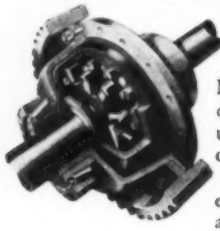
Macks ARE Masters

OF THE TOUGHEST TERRAIN



No matter how tough the going... under the worst of weather conditions... through slippery mire or shifting sand... or over rutted, uneven ground – big SUPER MACK trucks keep the payloads moving on time... at less cost and with less absenteeism.

One big reason why Mack trucks lick the toughest terrain is the exclusive Mack Power Divider. Where unequal tractive requirements are encountered, the Power Divider differential distributes torque to favor the driving wheel having the most traction, thus eliminating power dissipation in useless wheel slippage.

Mack's exclusive Power Divider combines with numerous other outstanding Mack features to give you the power, strength, traction and easy maintenance so necessary for dependable, uninterrupted service on the job. Your nearest Mack branch or distributor will give you complete details. You'll find it's a story worth listening to.

In tough quarry work big Model LR SUPER MACK trucks keep the loads moving—fast.

Mack TRUCKS ... outlast them all

Mack Trucks, Empire State Bldg., New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

at hard labor on the ROCK PILE

At Clark Hill Dam—$60,000,000 triple-purpose dam now under construction on the Savannah River—all aggregate rides from quarry to dam site on a 16-belt conveyor system. Here, as in outstanding construction projects the country over, conveyor belts specified by the G. T. M. —Goodyear Technical Man—are giving long, low-cost service.

G.T.M.-SPECIFIED GOODYEAR STYLE B CONVEYOR *runs from primary stock pile to crusher and screening plant.*

GOODYEAR INDUSTRIAL RUBBER PRODUCTS
GR-Specified
STYLE B CONVEYOR BELT
FOR AGGREGATE HANDLING SYSTEM
A
Tough cover resists cutting and abrasion
B
Multi-plies of mildew-inhibited duck, friction coated
C
Breaker strip available when specified
D
Cover of tough, abrasion resisting rubber
Available in 28 to 48 oz. duck, 3 to 10 plies, widths from 14" to 42" in stock sizes, other sizes to order; full range of cover gauges.

FROM CRUSHER TO STOCK PILES, *sized aggregate is stock-piled by shorter conveyors belted according to the G. T. M.'s specifications.*

UPGRADE *from stock piles to mix plant, all aggregate rides this Goodyear Style B conveyor.*

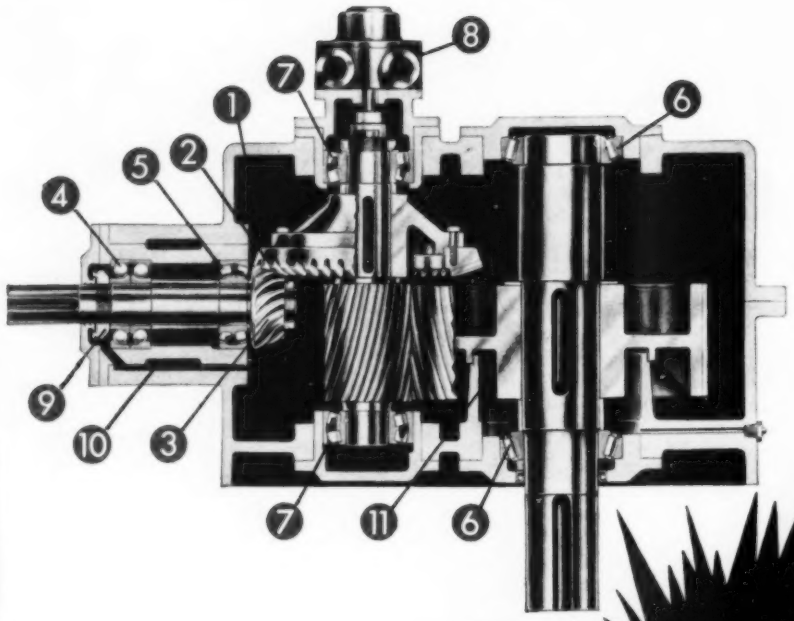
FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING, RUBBER-COVERED ROLLS built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

We think you'll like
"THE GREATEST STORY EVER TOLD"
Every Sunday—ABC Network

GOODYEAR

THE GREATEST NAME IN RUBBER

PIT AND QUARRY, September, 1951, Vol. 44, No. 3. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.



PUT US "ON THE SPOT"

Send For This "Text Book"

. . . make us tell you the "11 points" of superiority of PHILADELPHIA SPIRAL-BEVEL REDUCERS

These Units offer a dependable means of transmitting power at right angles (either horizontally or vertically). They're available in single, double and triple reductions . . . ratios ranging from 1.5 to 1 up to 238 to 1. Hundreds are in daily use throughout Industry. Send for Catalog SB-50 and kindly use your Business Letterhead when requesting it.

Philadelphia Gear Works, INC.

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

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Industrial Gears and Speed Reducers
LimiTorque Valve Controls

B-1047

TL-1530 Trailer with EUCLID

TRB-15D Trailer with GMC

TP-1114 Trailer with FORD

BD-1118H Body with AUTOCAR

ALL THREE new cement plants chose EASTON SIDE-DUMPS

BP-1114 Body with STERLING

Illustration below shows a double-bottomed EASTON TD-1222H Drop Door Side-Dump Trailer with MACK LR, capacity 45 tons. Investigate these, and other EASTON Side-Dump Trailers and Truck Bodies.

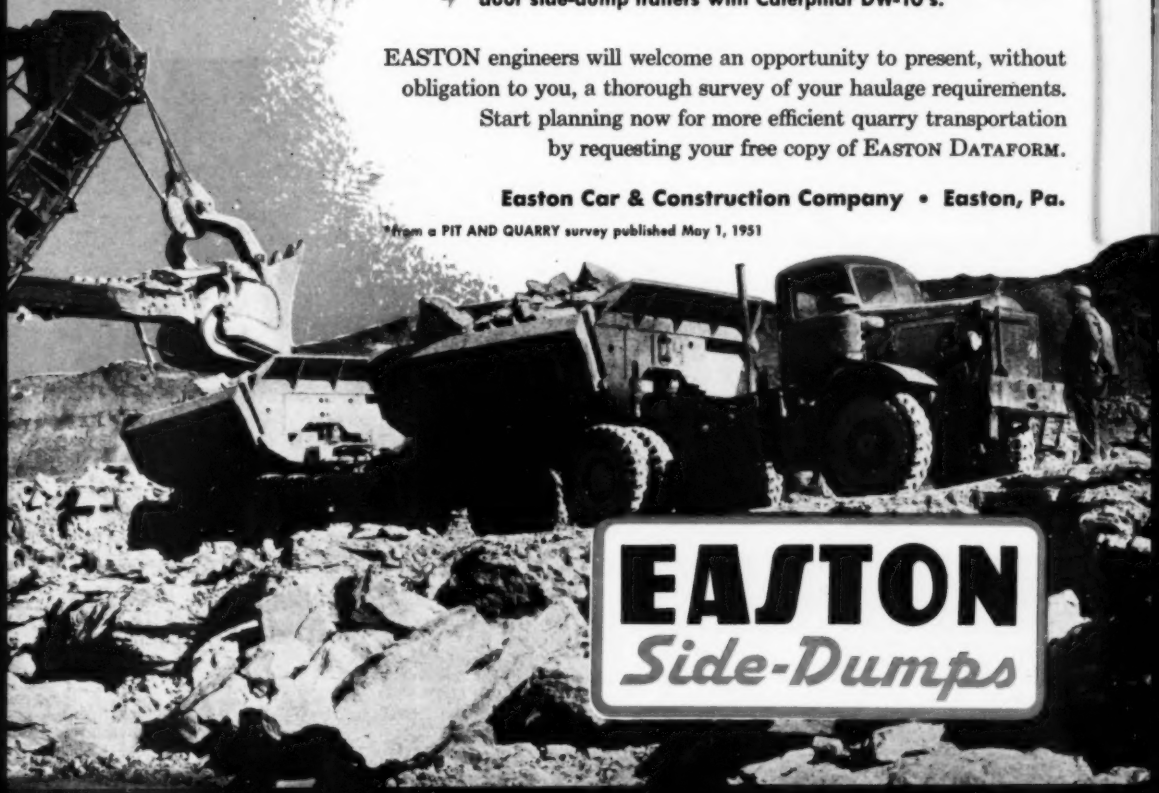
All three of the new cement plants which will operate quarries in the United States (classified as under construction or definitely planned for 1951)*, have chosen EASTON Side-Dumps for quarry haulage.

- **Two of the new plants will use EASTON Model TP-1114 pan type side-dump trailers with Mack LFT's.**
- **One of the new plants will use EASTON Model TL-1015 lift door side-dump trailers with Caterpillar DW-10's.**

EASTON engineers will welcome an opportunity to present, without obligation to you, a thorough survey of your haulage requirements. Start planning now for more efficient quarry transportation by requesting your free copy of EASTON DATAFORM.

Easton Car & Construction Company • Easton, Pa.

*From a PIT AND QUARRY survey published May 1, 1951



EASTON
Side-Dumps

Here is *Exactly WHY* a V-Belt with CONCAVE SIDES Gives You *Longer Wear!*

What Happens When a V-Belt Bends

Straight-Sided V-Belt

Gates Vulco Rope with Concave Sides

How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

The Concave Sides Fill Out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley — Uniform Wear — Longer Life!

To see for yourself how a V-Belt that has *concave sides* is certain to give longer wear, just make this simple test:—

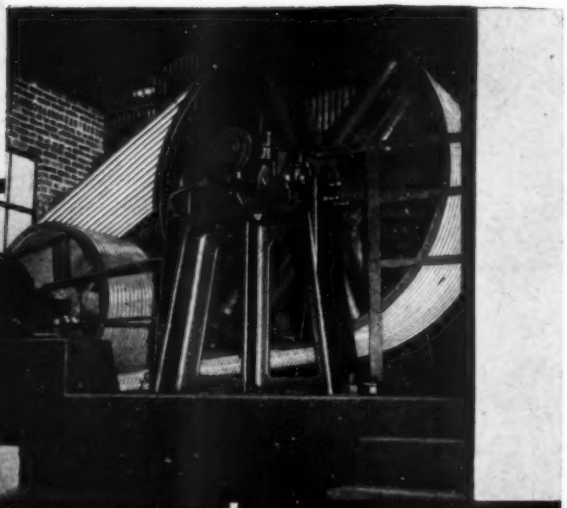
Pick up any V-Belt you have at hand. Bend that belt as it bends around a pulley. As it bends, grip its sides between your fingers. Here is what will happen *everytime*.

If the V-Belt you are testing has *straight sides*, you can feel those sides *bulge out* as the belt bends. This out-bulge forces the sides of the belt to press *unevenly* against the V-Pulley and you naturally get *concentrated* wear just where the bulge is greatest—as shown in figure 1-A, at left.

Now, make this same test with the belt that is built with Concave *Sides*—the Gates Vulco Rope!

Whereas you felt an *out-bulge* when you bent a belt with straight sides, you find that the *Concave Sides* merely fill out and become *perfectly straight*. The sides therefore *press evenly* against the V-Pulley. This distributes the wear *uniformly* across the *full width* of the belt. Naturally, this means longer belt life and *lower* belt *costs* for you!

Only V-Belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure that you get the V-Belt with the Concave Sides—The Gates Vulco Rope!



Gates Vulco Rope Drive on the Mine fan of Sloss Sheffield Steel & Iron Company, Birmingham, Alabama. The drive operated 24 hours a day for 3 years without down-time.

CS-517

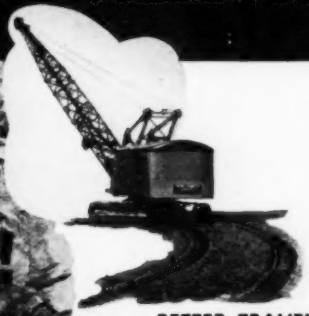
Gates

Hose V-Belts
Molded Rubber Goods
for Industry

VULCO ROPE **DRIVES**
ENGINEERING OFFICES AND JOBBER STOCKS
IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY
DENVER, U. S. A.
The World's Largest Makers of V-Belts

Why the NORTHWEST is a BETTER MINING SHOVEL!



BETTER TRAVEL

The Northwest Steering is smoother — easier on operator and machine with *positive* traction on *both* crawlers while turning as well as when going straight ahead.

BETTER CONTROLS

The "Feather-Touch" Clutch Control gives easy operation. It is free from complications or sensitive mechanism. No special servicing is ever required and manual control can be had on the instant.

BETTER SWING CLUTCHES

Uniform Pressure Swing Clutches that grip easily, are free from jerks and grabs that make spotting the load difficult and waste digging time.

BETTER CROWD

The Northwest Dual Independent Crowd utilizes force most other independent crowds waste assuring the handling of tough digging with greater output.

CUSHION CLUTCH

Reduces shock overloads of heavy digging *before* they can damage machinery.

THE Northwest is a real Rock Shovel proved in hard rock work. Greater simplicity in design makes maintenance easier. Unusual mobility as compared with other crawler designs saves time clearing for shots. Fast swing and high capacity under many conditions improves output over larger equipment. The Helical Gear Drive gives smooth trouble-free transmission of power. Cast Steel Bases and Machinery Side Frames are ruggedly built and maintain shaft alignment and Ball and Roller Bearings on all high-speed shafts cut power losses to the minimum.

In the Northwest you have a combination of advantages not found in any other shovel size for size — advantages that mean greater output and lower cost operation.

NORTHWEST ENGINEERING COMPANY

1515 Field Building • 135 South LaSalle Street • Chicago 3, Illinois

NORTHWEST

Convertible for any Mining Material Handling or Excavation Problem

LITTLE THINGS HAVE A WAY OF ADDING UP!

Especially today—there's extra need to guard your expensive equipment against excessive downtime. Sometimes this is caused by seemingly *small* things, but these small things can result in stuck rings, scored cylinders, worn bearings —and really add up to costly trouble! For example...

In an Eastern bus fleet, major overhauls became necessary after 60,000 to 80,000 miles—well below previous mileage. A Socony-Vacuum engineer was called in. He traced the trouble to road dust by-passing the air cleaner and reaching the engine cylinders. His recommendations *doubled* the mileage between overhauls, and saved the cost of an expensive investigation.

In *your* operation, too, there may be conditions which—unknown to you—are affecting the Correct Lubrication of your machines, thus increasing maintenance costs and cutting your profits. *Why not find out?*

Socony-Vacuum, with 85 years of lubrication experience, will develop a program of Correct Lubrication custom-made for *your* equipment and operating conditions. Why not get this program started *today?*

Here's Practical Help for Contractors . . .

Socony-Vacuum gives you . . .

- Help on maintenance problems.
- Individual, tested lubrication schedules.
- Advice on correct application of lubricants, proper handling and storing.
- One source of supply—available everywhere.
- Simplified inventory—with . . .

1. **DELVAC OILS**—for all gasoline and automotive-Diesel engines.
2. **MOBILUBE GX**—multi-purpose gear lubricant for all enclosed gears—manually operated transmissions, rear axles and final drives.
3. **MOBILGREASE**—in grades and types for proper lubrication of all chassis parts and engine accessories.

SOCONY-VACUUM

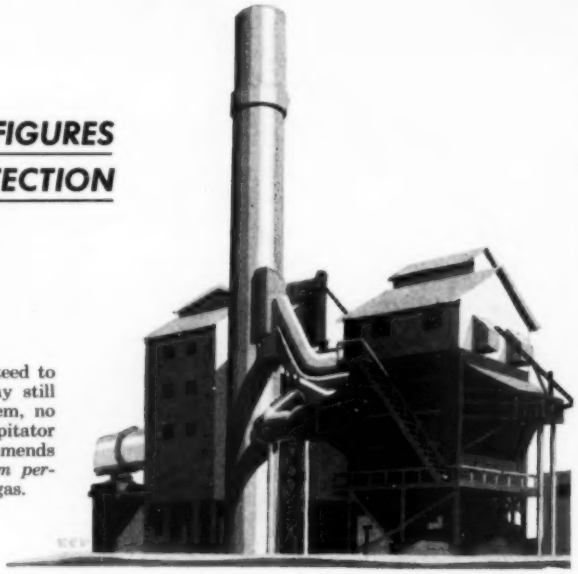
CORRECT LUBRICATION

for Contractors

**THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL COMPANY, INC.
MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION**

HIGH EFFICIENCY FIGURES ARE NO PROTECTION

Unless residual content is guaranteed to meet your specifications, you may still face a nuisance abatement problem, no matter how efficient your precipitator may be. That's why Koppers recommends that you always specify *maximum permissible dust residual* in the clean gas.



Koppers-Elex Electrostatic Precipitators solve nuisance abatement problems ——*once and for all!*

HERE'S THE RECORD*

A Koppers-Elex Precipitator installed on a Rotary Rock Dryer was guaranteed to limit stack discharge to 0.2 grain per cubic foot. Based on tests by the customer, the stack discharge is actually less than 0.1 grain per cubic foot . . . well within the present nuisance abatement regulations!

SCORES of plants have found that Koppers-Elex electrostatic precipitators are the permanent solution to nuisance abatement problems. Once the Elex precipitator is installed you are assured of lower dust residuals, a guaranteed degree of cleaning and operation with a minimum of outage time.

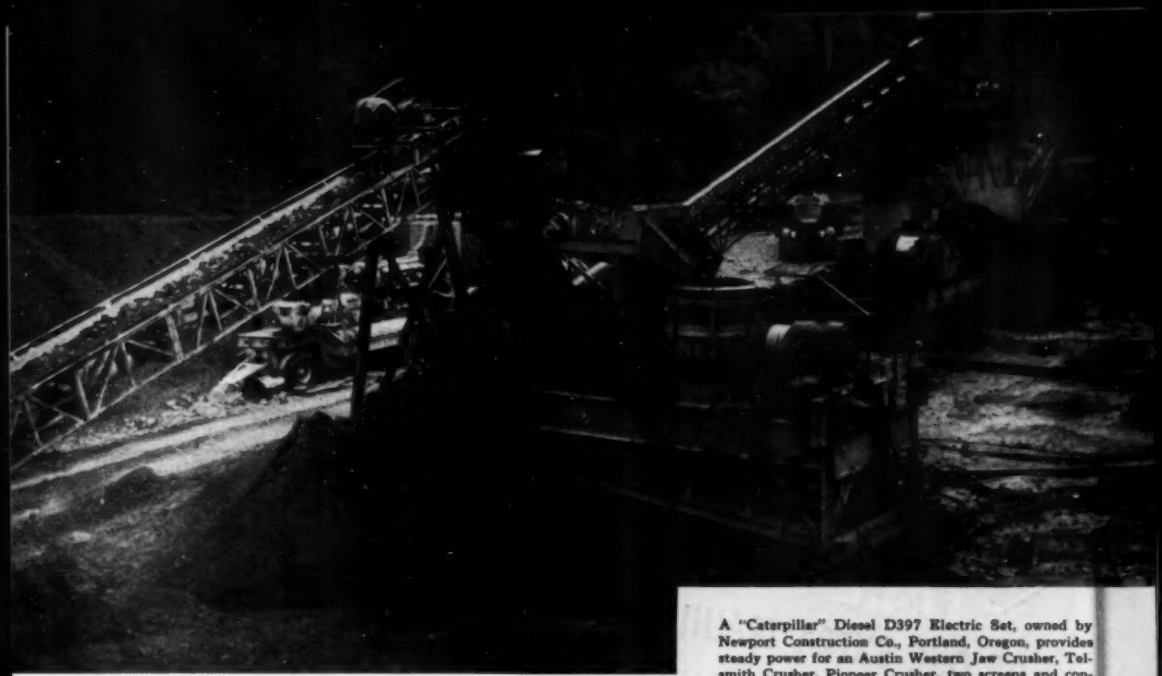
Re-entrainment, the big problem in nuisance abatement, is held to an absolute minimum because rapping is sectionalized. Successive collection zones are separately energized to provide maximum voltage in each field for maximum cleaning. You may specify either conventional storage type hoppers or Koppers *unique bottom drag scraper* which gives you continuous dust feed!

Hundreds of Elex precipitators are in use today all over the world. Koppers-Elex electrostatic precipitators are designed, engineered, fabricated and erected under one contract by the Koppers Company . . . and each installation comes complete with Koppers 'packaged mechanical or vacuum tube power pack. If you have a gas-cleaning problem, write today! Koppers Company, Inc., Precipitator Dept., 289 Scott Street, Baltimore 3, Maryland.

Koppers-Elex ELECTROSTATIC PRECIPITATORS

KOPPERS

***Guaranteed:** Koppers-Elex precipitators are guaranteed to equal or better (under tests made by your own personnel) any efficiency or residual content you specify.



A "Caterpillar" Diesel D397 Electric Set, owned by Newport Construction Co., Portland, Oregon, provides steady power for an Austin Western Jaw Crusher, Telsmith Crusher, Pioneer Crusher, two screens and conveyors at a rock crushing plant near Estacada. Production averages 90 yards per hour. Other "Caterpillar" equipment in the Newport line-up: Two D8 Tractors, one D4 Tractor and two No. 12 Motor Graders.

There's a big job ahead

How your equipment takes the beating of the months ahead is important to the whole defense effort of the free world. More than 58 billion tons of limestone and cement rock, crushed stone, sand and gravel are needed this year as a vital factor in defense. And we're entering a period when machinery must stand up or else.

Military needs and Defense Rated Orders are taking their share of "Caterpillar" production. Shortages of steel and other materials add to the difficulty of supplying the entire demand for new engines and machines. This means that *present equipment must be kept in use.*

"Cat" Diesel Engines are built to handle the rugged duty that goes with quarry operations. And "Cat" Diesel Tractors, Motor Graders and Earthmoving Equipment have the stamina to serve you long and faithfully under the toughest conditions. *How* long is up to you. Good care pays off in longer wear.

You can add many hours to equipment life if you follow sound maintenance practices. Anticipate your parts needs *before* wear goes beyond repair. Talk it over with your "Caterpillar" dealer. He is qualified to give competent opinion. If a part is not readily available, he has the tools and knowledge to rebuild many worn parts — and keep your machinery on the job.

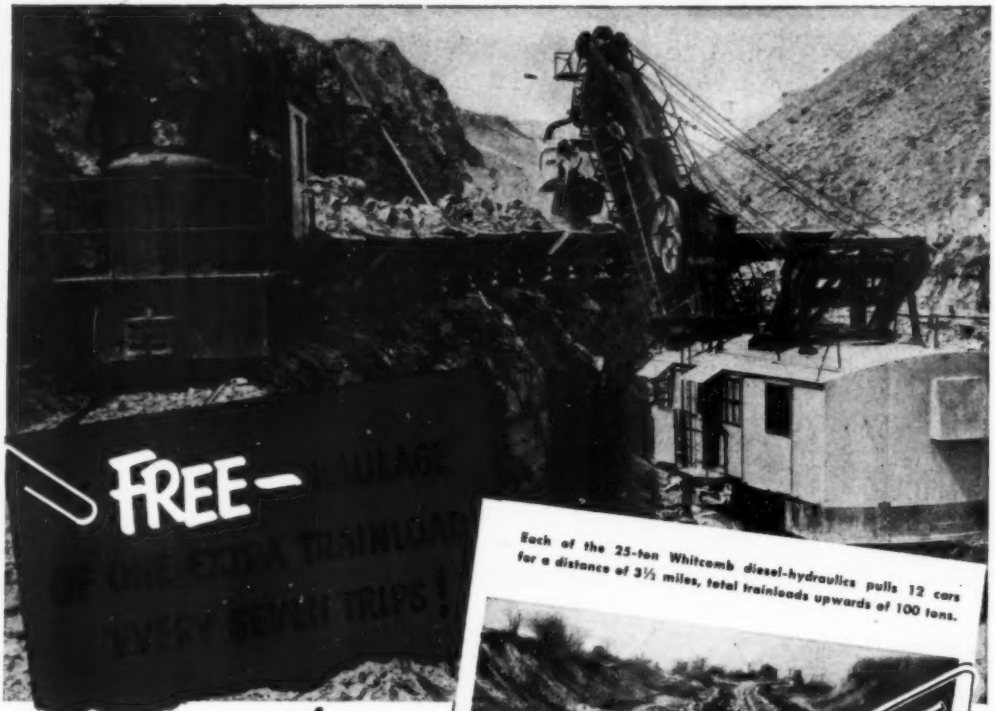
CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

You're the Doctor

Don't let your engine overheat. Maintain the cooling system, keeping it free of scale, rust and sediment. Use soft or treated water and, when freezing temperatures exist, protect your engine with anti-freeze. Clean the radiator periodically, removing foreign matter from the core by brushing or washing. Use chemical flushing solutions. Prevent engine troubles which come with overheating. Consult your Operator's Instruction Book.

CATERPILLAR
REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT



Each of the 25-ton Whitcomb diesel-hydraulics pulls 12 cars for a distance of 3½ miles, total trainloads upwards of 100 tons.

It's a cost-cutting result of using Whitcomb Diesel-Hydraulics!

Switching to Whitcomb diesel-hydraulics has paid big dividends to The Carbon Limestone Company. More than 20% more stone is hauled each trip! *Eight men, out of a 16 man stone haulage crew, have been transferred to other work!*

Which is typical of the cost-cutting advantages of Whitcomb diesel-hydraulics. And, in addition, there is the greater cleanliness, the greater employee comfort and thus better employee relations, the 24-hour-a-day availability.

Interested in cutting *your* track haulage costs? Then write today! We'll be glad to analyze your problem . . . show how a Whitcomb locomotive can give substantial savings over your present steam locomotives.

THE WHITCOMB LOCOMOTIVE COMPANY
Rochelle, Illinois

WHITCOMB
DIESEL-HYDRAULIC LOCOMOTIVES

Subsidiary of
BALDWIN-LIMA-HAMILTON CORPORATION

BALDWIN BLH LIMA-HAMILTON

A COMPLETE LINE!

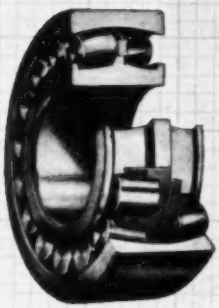
Whitcomb builds a complete line of Diesel-hydraulic, Diesel-electric and Diesel-mechanical locomotives. Diesel-hydraulics from 10 to 40 tons, Diesel-electrics from 20 to 95 tons, and Diesel-mechanicals in 5 and 8 tons.

Every Whitcomb locomotive reflects the pioneering engineering that gave industry the *first* gasoline locomotive, as well as the *first* explosion-proof, electric storage battery locomotive.

"Caterpillar" Diesel Tractors develop

more workpower from horsepower

. . . through Torrington Bearings



In the constant mesh transmissions of "Caterpillar" D6, D7 and D8 Tractors, Torrington Spherical Roller Bearings are used to provide larger load capacity and smoother flow of power from the engine to the tracks.

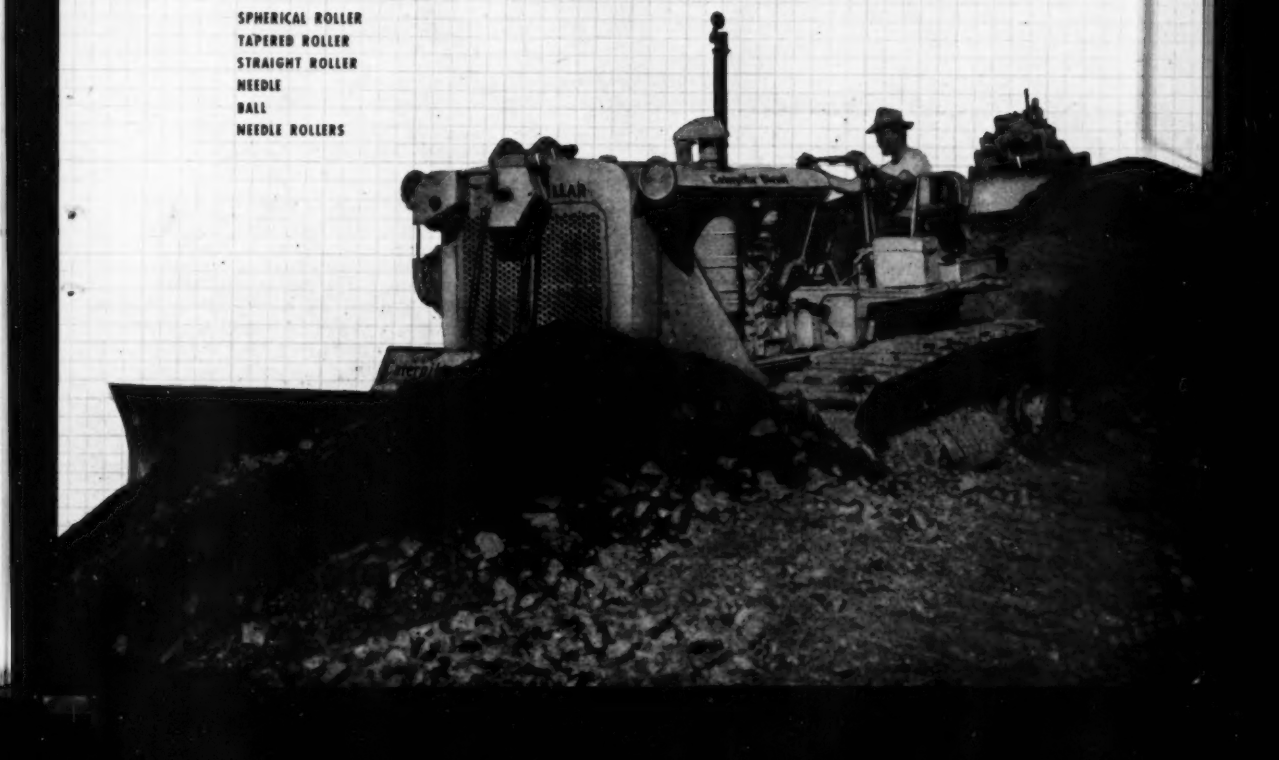
On the upper transmission shafts of the D6, D7 and D8, and on the pinion shaft of the D8, these self-aligning bearings automatically compensate for possible shaft deflections—binding stresses cannot develop.

Torrington Spherical Roller Bearings are helping all kinds of heavy-duty equipment do a better job, with a minimum of "time-out" for maintenance. Why not let our engineers show you how these high-capacity bearings can improve the efficiency of your machinery?

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON SPHERICAL ROLLER BEARINGS

SPHERICAL ROLLER
TAPERED ROLLER
STRAIGHT ROLLER
NEEDLE
BALL
NEEDLE ROLLERS



Here's how rubber-tired TOURNADOZER speeds quarry operations

WORKS SCATTERED JOBS

Doing the work previously handled by 3 crawler-dozers, 19 m.p.h. Tournadozer is kept busy by an Arkansas bauxite mining firm handling "work-and-run" shovel clean-up, maintenance jobs on stockpiles, along haul roads and around strip pits scattered as far as 5 miles apart. "Spare time" tasks include building levees, clearing timber, pulling a Rooter, towing and pushing trucks up grades, through mud.

You get action-fast

Tournadozer is the answer to dozing problems in quarry and sand and gravel pit operations. It runs on giant 21.00 x 25 low-pressure tires at speeds to 19 m.p.h., goes anywhere . . . any time. All-weather Tournadozer works in toughest materials . . . up steep grades . . . through mud, sand or snow. Tough tires eliminate expensive crawler track maintenance which is especially severe in pit and quarry operation due to the multiple moving parts which must work in highly abrasive materials. Highly maneuverable, Tournadozer often replaces 2 or more crawlers . . . handles dozens of assignments in-or-out of pit . . . can travel a mile away in a few minutes, driving cross-country or over highway without trailer loading or unloading delays.

Tournadozer can be kept working profitably all year with either its standard dozer blade, interchangeable Angledozer, or V-type Snow Plow, or hauling a Rooter or stripping with hauled Scrapers. Four-wheel drive, instant gear change with constant-mesh transmission, heavy-duty 4-wheel air brakes with 2822 sq. in. of braking area, plus electric control, give you a combination that out-performs crawlers 2 to 3 times. Torque converter is optional.

Check these performance records, then ask your LeTourneau Distributor for all the facts on how Tournadozer can make money on your operations.

Tournarocker – Trademark
Tournapull, Carryall, Rooter, Angledozer, Tournadozer – Trademark Reg. U. S. Pat. Off.

LETOURNEAU LET EQUIPMENT

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT

FEEDS GRAVEL FROM PIT

Strong Company, Springville, Utah bought a Tournadozer to feed gravel from pit to mix plant. Their 144 h.p. crawler-dozer had delivered 81.3 yds. per hr. on a short 175' one-way push. Tournadozer, with side wings, moved 94.5 yds. an hour on 321' one-way push, doubling the crawler's output: 303.34 station yds. hourly to crawler's 142.1. Result: they bought a second Tournadozer.

GRADES AND MAINTAINS ROADS

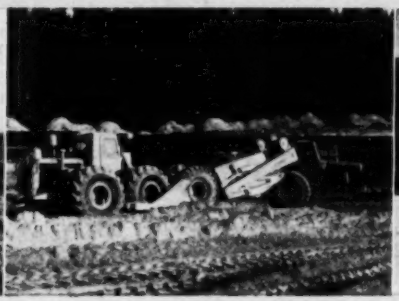
At pit north of Arctic Circle at Kirkenes, Norway, over 25 million yds. of rock ore being removed to uncover magnetite ore. Sydveranger, A/S, Oslo, began hauling with six 40-ton, rear-dump Tournarockers, later added 6 more *plus* 2 C Tournadozers. Dozers build and maintain haul roads and handle shovel clean-up. The 14 LeTourneau units handle 12,000 tons of rock and ore per day.

SHOVEL CLEAN-UP

Working at Stanley Mining Company's ore pit at Biwabik, Minn., Tournadozer's principal job is handling clean-up around the loading shovel. But on this 24-hr., 7-day a week ore operation, Tournadozer utilizes normal waiting periods at the shovel, to maintain rock dump, clean spillage at crushing plant . . . feed material from surge pile to hopper . . . clear timber ahead of rock drill, etc.

MAINTAINS DUMPS

Tournadozer's high speed and rubber-tired mobility enable it to keep busy day and night for the E. W. Coons Co. at the Genoa strip mine at Eveleth, Minn. During one typical 10-hour *night* shift, the big rig maintained 2 overburden dumps and lean ore stockpile, did clean-up work around 3 stripping shovels, found time to do haul road maintenance besides.



PUSH-LOADS SCRAPERS

J. Neils Lumber Co., Libby, Montana, teamed this C Tournadozer with 3 C Tournapulls on an 800,000-yd. access road near Rexford. With Tournapulls on 2000' cycles, Tournadozer pushed 42 loads of sand an hour . . . on 600' cycles, 54 loads hourly. Load distance for 9½ pay yards averaged 75' . . . load time, 30 seconds. With Angledozer blade mounted, rig speeds sidehill work.

DOZES, LEVELS QUARRY ROCK

On bauxite stripping near Little Rock, Arkansas, 1 Tournadozer handles 5 major jobs every day . . . is on call 24 hours. It dozes bauxite ore into 4 to 8 grizzlies . . . maintains quarry rock stockpile . . . cleans up around two 2½-yd. shovels . . . pulls 13-yd. wagon to haul and spread waste material. "Tournadozer's been doing the work of 2 crawlers," reports Plant Supt.

PULLS HEAVY EQUIPMENT

Skidding heavy compressor is one of many maintenance jobs Tournadozer handled around Interstate Iron Co. mines near Calumet, Minn. The "C's" big, diesel engine and 4-wheel drive develop plenty of drawbar pull to handle heavy loads. It pulls Carryall-Scrapers, tows Rooters, heavy-duty trailers, bogged-down trucks; skids generator plants, cable-boats, poles, piling, etc.

SPEEDS STRIPPING YEAR AROUND

At its Middle Branch, Ohio plant, Diamond Portland Cement Co. strips shale the year 'round with C Tournadozer. During winter, Tournadozer broke up and dozed to shovel 15 to 18" of frozen shale. "Will move as much shale in ½ day as our crawler can in a full day," says Vice President E. H. Evans. For clean-up at plant, rig runs 3 miles from pit over asphalt roads in a few minutes.

PLOWS SNOW

In addition to shovel clean-up and leveling spoil, Butler Bros. Iron Mining Co.'s C Tournadozer cleared snow from railroad tracks and access roads at their mines near Cooley, Minn. Soft rubber tires do not damage rails, ties or pavement. Rig also mounts a LeTourneau 12'3" x 6'6" V-type snow plow with vertical divider plate to eliminate plowing snow back onto road.

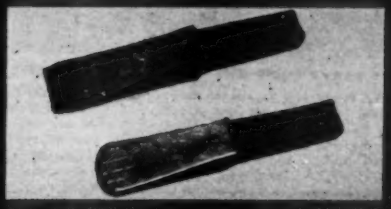
R. G. LeTourneau, Inc.,

PEORIA, ILLINOIS, U.S.A.

SOME MIGHTY BIG CONTRACTORS ARE TRIPLING THE LIFE OF WEAR SURFACES AT ONLY HALF THE COST OF OTHER METHODS BY USING WEAR-ARC ELECTRODES

and they are conserving critical metals.

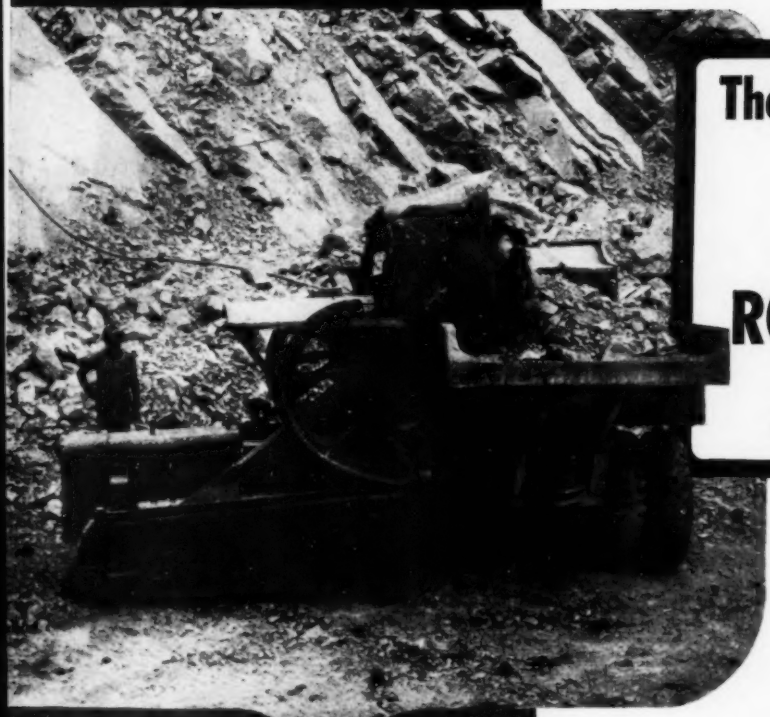
ANY equipment parts that are subject to rough impact or severe abrasion are likely applications for Wear-Arc hard facing. Write for Bulletin 5651 for application information and welding procedures.



Alloy Rods Co.

ALLOY RODS COMPANY
No Finer Electrodes Made . . . Anywhere
YORK, PENNSYLVANIA

AR-5



The most dependable high capacity ROCK LOADER on the market

FASTER LOADING

RUGGED CONSTRUCTION

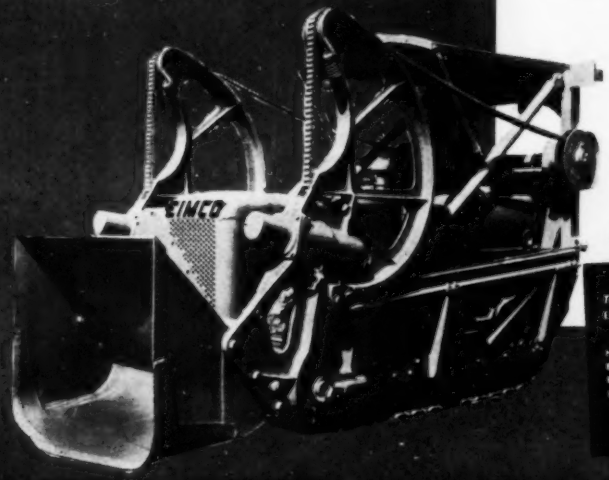
LOW MAINTENANCE COSTS

LOW INITIAL INVESTMENT

Eimco crawler-mounted loaders are built to the same design as our famous underground RockerShovels. Their efficiency is proved by the daily performance of over 6,000 machines in mines the world over.

700 to 800 yards of rock loaded, per 8 hours, is normal 104 performance.

You can make money with an Eimco "104." Let us tell you about it.



EIMCO

A540

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 10, UTAH, U. S. A.

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IN FRANCE, SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND, EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

PIT AND QUARRY MEN AGREE . . .

You can do the Job BETTER, SAFER, FASTER with PRIMACORD®

PRIMACORD produces a powerful detonating wave which travels at approximately 4 miles per second throughout its length. It acts as the detonating agent for all holes in the shot.

The infinitesimal time lag between holes and rows of holes permits planned rotation firing, relieves burden. The powerful detonation of each portion of each charge produces more work from your explosives.

Primacord is insensitive to stray electrical currents – cannot be set off by friction, sparks or ordinary shock.

Add to this the ease of handling, simplicity of hook-up, and high tensile strength . . . you'll see why it is the almost universal choice of pit and quarry men.

WIRE COUNTERED PRIMACORD. Armored with closely stranded brass wire, Wire Countered Primacord is the answer where deep, ragged holes and high abrasive conditions are encountered. The wire sheath increases tensile strength to 220 lbs. Weight per 1000-foot spool is 35 lbs.

PLASTIC REINFORCED PRIMACORD. Use it for extremely deep, wet holes, river crossings, or wherever water is a problem. It is also resistant to acids commonly encountered. Although Plastic Reinforced Primacord weighs only 22 lbs. per 1000-foot spool, its tensile strength is 250 lbs.

REINFORCED PRIMACORD. Depend on it for use in deep holes where extra tensile strength (160 lbs.) or resistance to abrasion are desirable. Tough, but resilient and easy to handle, it is gaining in popularity for general use. 1000-foot spool weighs 20 lbs.; tensile strength 160 lbs.

PLAIN PRIMACORD. For shallow holes, surface trunkline use and other applications where abrasive and other rugged conditions are not considerations. 1000-foot spool weighs 19 lbs., tensile strength 113 lbs.

P-55

Users of Primacord agree that there is no substitute for its general excellence. Consult your explosives supplier for complete information, or write to us direct.

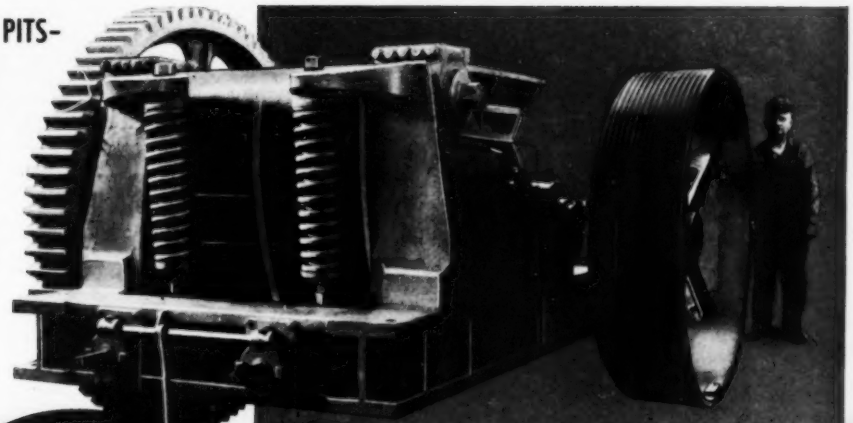
THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut

PRIMACORD®-BICKFORD

DETONATING FUSE

Also Ensign-Bickford Safety Fuse — Since 1836

FOR USE IN PITS-
MINES and
QUARRIES



3 ways

1. The McLanahan Single Roll Rockmaster Crusher is low in cost. Few parts for construction make it less expensive to build.

2. The McLanahan Rockmaster Crusher makes possible low operating cost because continuous crushing wastes no power.

3. The McLanahan Rockmaster Crusher requires a minimum of repairs due to simplified construction.

with McLANAHAN *Single Roll*

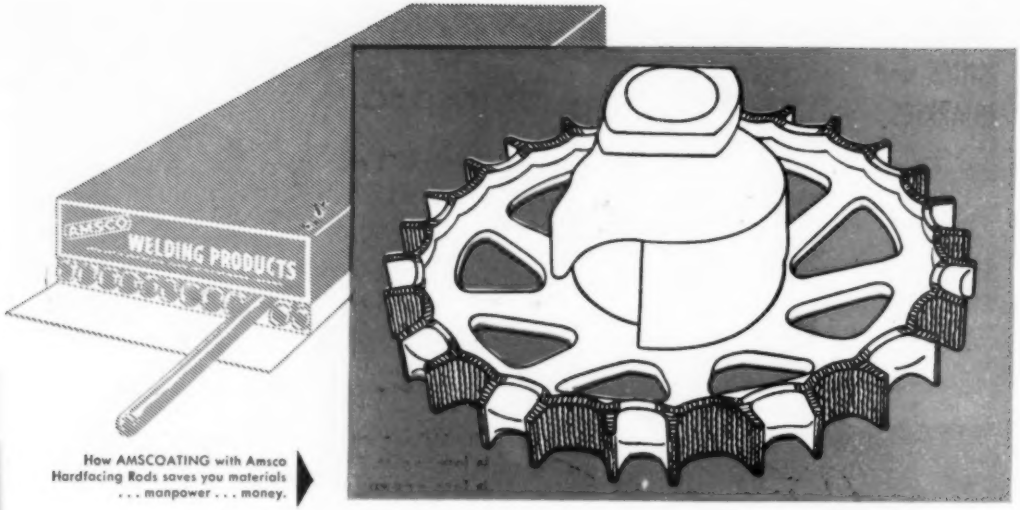
ROCKMASTER CRUSHERS

Extremely popular in pits, mines, quarries, cement, furnace and open hearth slag plants . . . these heavy duty machines have exceptional capacities because they crush material constantly. All steel construction with cut steel gears, heavy split phosphor bronze bearings, automatic steelstrut toggle for adjustment and tramp iron protection, interchangeable and reversible crushing plate liners on improved removable bronze bushed crushing plate, heavy balanced V-grooved pulley . . . McLanahan Rockmaster Crushers are rugged and modern. They are the answer to *your* crushing problems.

Write today for
Bulletin RM-505

McLANAHAN & STONE CORPORATION
Pit, Mine and Quarry Equipment Headquarters Since 1835
Hollidaysburg, Pennsylvania

Dependable Products: Single and Double Roll—and Jaw Crushers, Crushing Plants, Reciprocating Plate and Apron Feeders, Roll Grizzlies, Conveyors, Elevators, Screens, Scrubbers, Steel Log Washers, Sand Dregs, Hoists, Jigs, Dry Pans, Dryers, Scrap Sunders, Pulleys, Gears, Bearings, Sprockets, Sheaves, Rollers, Bin Gates, Elevator Buckets, Gratings, Car Wheels, Ferrous and Bronze Castings.



How AMSCOATING with Amsco Hardfacing Rods saves you materials . . . manpower . . . money.

These teeth take bites out of repair costs!

AMSCOATING...stands for control of wear by Hardfacing...

Hardfacing rods—and recommendations for their use—are as sound as the manufacturer who makes them. AMSCO has been fighting wear for a half-century—first with Manganese Steel, and later with AMSCO Hardfacing Products.

If you have a problem of wear caused by impact, abrasion, heat or corrosion . . .

Find out how AMSCOATING can save you materials . . . manpower . . . money!

AMSCOATING can make old Tractor Drive Sprockets last 3 times longer than new.

Here's another way to beat the high cost of replacements, down-time and maintenance . . . AMSCOATING the teeth on Tractor Drive Sprockets. Time after time service records have shown that AMSCOATING of sprockets results in these dollar-saving advantages:

1. ***On an average — 3 times the service life of a new, unhardfaced sprocket.***
2. ***2 out of 3 sprocket changes completely eliminated . . . far less down-time, less maintenance . . . more equipment out of the shop and on the job.***

To top it off, sprocket replacements can practically be eliminated. An AMSCOATED sprocket can be reclaimed over and over again . . . *at about half the cost of a new one!*

Get all the facts on how to make these big savings . . . write today for instruction sheet on AMSCOATING sprockets, and the name of your nearest AMSCO Distributor.

AMSCOATING

THE RIGHT WAY TO SAY HARDFACING

AMERICAN Brake Shoe COMPANY

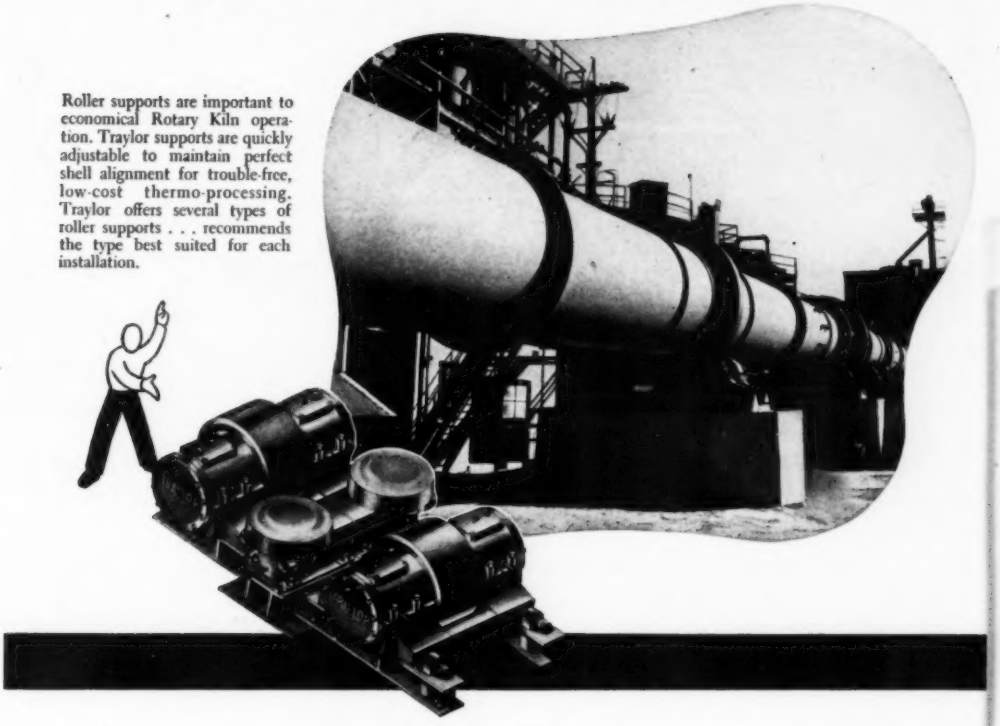
AMERICAN MANGANESE STEEL DIVISION

396 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

"Everything considered..."
means lower thermo-processing costs with a Traylor Rotary Kiln

Roller supports are important to economical Rotary Kiln operation. Traylor supports are quickly adjustable to maintain perfect shell alignment for trouble-free, low-cost thermo-processing. Traylor offers several types of roller supports . . . recommends the type best suited for each installation.



Everything . . . *even the most minor detail* . . . is carefully considered before Traylor builds a Rotary Kiln. 40 years of experience has demonstrated to Traylor that the smallest details . . . as well as the more obvious factors . . . play an important part in every efficient Rotary Kiln installation. Place your thermo-processing problem in Traylor's hands where *"everything considered"* means lower costs for you.

Traylor

Rotary Kilns, Coolers and Dryers · Grinding Mills
Jaw, Reduction and Gyratory Crushers · Crushing Rolls

MAIL THIS COUPON
FOR FREE TRAYLOR KILN BOOKLET

TRAYLOR ENGINEERING & MANUFACTURING CO.
388-A MILL ST., ALLENTOWN, PA.

Send me your latest booklet on the operating advantages of Traylor Rotary Kilns.

Name_____

Company_____

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SALES OFFICES: New York, N.Y.; Chicago, Ill., Los Angeles, Calif.
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A "TRAYLOR" LEADS TO GREATER PROFITS

LOOKING FOR BIG PRODUCTION?

A TRAXCAVATOR is your answer whether you operate an underground quarry or an open pit. TRAXCAVATORS have proven, on hundreds of jobs, that they can dig, load and work stockpiles quickly and economically.

All TRAXCAVATORS, powered by their matching "Caterpillar" Diesel Tractors, have the digging ability that gets heaped bucket loads every pass—in any material from shot rock to common earth. They can dump directly into trucks . . . carry to or load from stockpiles . . . feed screens and hoppers and do additional production boosting jobs.

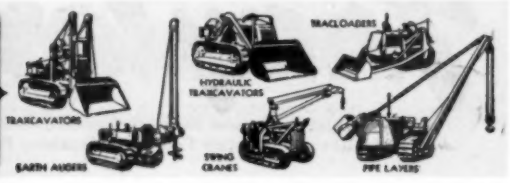
Over and above their regular duties, TRAXCAVATORS strip overburden, shift tracks, maintain haul roads, load and plow snow, pull, haul, hoist, grade, level, and do many other supplemental tasks.

See your nearby TRACKSON-CATERPILLAR Dealer for full information on all five TRAXCAVATORS (½ to 4 cubic yard sizes) or write TRACKSON COMPANY, Dept. PQ-91, Milwaukee 1, Wisconsin.

Upper: This HT4 TRAXCAVATOR loading gravel in Santa Ana, California, gets big daily production.

Lower: In Tulsa, Oklahoma, this HT4 excavating from a bank, gets a full load every pass.

TRACKSON
TRACTOR EQUIPMENT



Mobilizing Quarry Equipment

THE URGENT CALL for more output is demanding optimum capacity from every piece of equipment, with downtime cut by more efficient maintenance. This new pressure for production has turned many additional operators and operating men to Cities Service lubricants because:

1st—The complete Cities Service line affords correct lubricants to stand the gaff, in even the hardest-worked equipment.

2nd—The alert, substantial Cities Service organization affords you the same complete confidence as these lubricants.

3rd—Cities Service stands ready with competent technical aid, especially capable of ironing out lubrication difficulties.

You can cut time and costs on the job; you can cut lost motion in ordering and delivery, by concentrating responsibility on Cities Service. The line is complete. The quality is always tops.

For further information about our technical aid write CITIES SERVICE OIL COMPANY, Room 121, Sixty Wall Tower, New York City 5. Or call your nearest Cities Service office.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Versatile? That's FARRELL-CHEEK

INDUSTRIAL parts are certain to be wear-resistant when they are made from Farrell-Cheek's superb cast steels. Over forty years of experience in the manufacture of fine steel castings has brought the wide experience and versatility which makes Farrell-Cheek your sure source for the best.

Special alloy steels, together with modern hardening and heat treat methods, will provide you with parts which have strength, durability, and outstanding resistance to shock and wear. Farrell-Cheek offers a complete one-point service for all your needs.

Careful design, manufacturing methods, and controls which assure close tolerances, permit the manufacture of high quality parts which can be furnished readily, either to standard or special design.

All of Farrell steels, Carbon, F "85", and "Hard Edge", have been developed for those specific qualities which give maximum strength, durability under hard use, and machinability when specified. F "85" can be hardened throughout, and has fine qualities of rigidity and toughness, and withstands abrasive wear many times longer than ordinary parts. "Hard Edge" is specially adapted to controlled depth penetration of hardness, and thus allows fine machining qualities at essential points.

Whether it is elevator or conveyor parts, wheels, chains or sprockets, gears, pinions, or crusher parts, Farrell's "85", Farrell's Carbon Steels, and Farrell's "Hard Edge" will serve you longer . . . serve you better.

FARRELL-CHEEK STEEL CO.

MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS
FARRELL'S HARD EDGE STEEL CASTINGS
FARRELL'S "85" STEEL CASTINGS

RAILROAD CASTINGS
Locomotive and Car
R. R. Specialty Castings.

ELEVATOR, CONVEYOR PARTS
Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers.

BUSHINGS
Carbon and Alloy Steels Machined, Hardened, Ground.

CRANE WHEELS
Overhead, Gantry, Monorail, Ingot Car, Charging Machine.

GEARS AND PINIONS
"True Tooth" Gears and Pinions, Sheaves and Wheels.

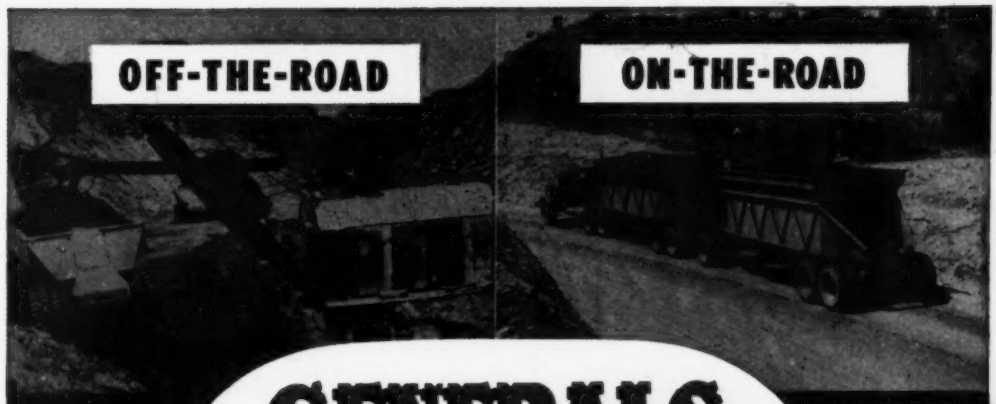
SPECIALIZED CASTINGS
Light Section Castings.

STOKER PARTS
Feed Screws, Furnace Tools, Flanged Pipe, etc.

HEAVY HARDWARE
Wire Rope Fittings, Choker Hooks, Bar Benders, Cutters.

SANDUSKY, OHIO U.S.A.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS



GENERALS

Resist cuts, scrapes, bruises...
Give more traction! More speed!
More safety—

WORK FASTER... LAST LONGER... COST LESS

more profit for you per job!

GENERAL L. C. M. Broad, deep, self-cleaning tread lugs and reinforced shoulders for more traction off-the-road. Longer wear on razor sharp mine and quarry surfaces.

GENERAL H. C. T. for most work on-the-road, some off. More rubber, more cords per inch for greater safety. Extra traction through sand, gravel, slush, mud.

THE GENERAL L.C.M.

THE GENERAL H.C.T.

GENERAL UNDERGROUND MINING TIRE

Extra strong, extra thick rubber at the shoulders. Resists cuts, snags, bruises. More traction. More wear.

REQUEST GENERAL TIRES ON YOUR NEW EQUIPMENT

"EUC" PERFORMANCE Pays Off

IN MINES and QUARRIES

"Eucs" are designed and built for moving coal, rock, ore, overburden and heavy excavation at the lowest cost. The simple but rugged construction of Euclids, combined with large capacity, ample power and speed, provide efficient off-the-highway hauling of practically any material.

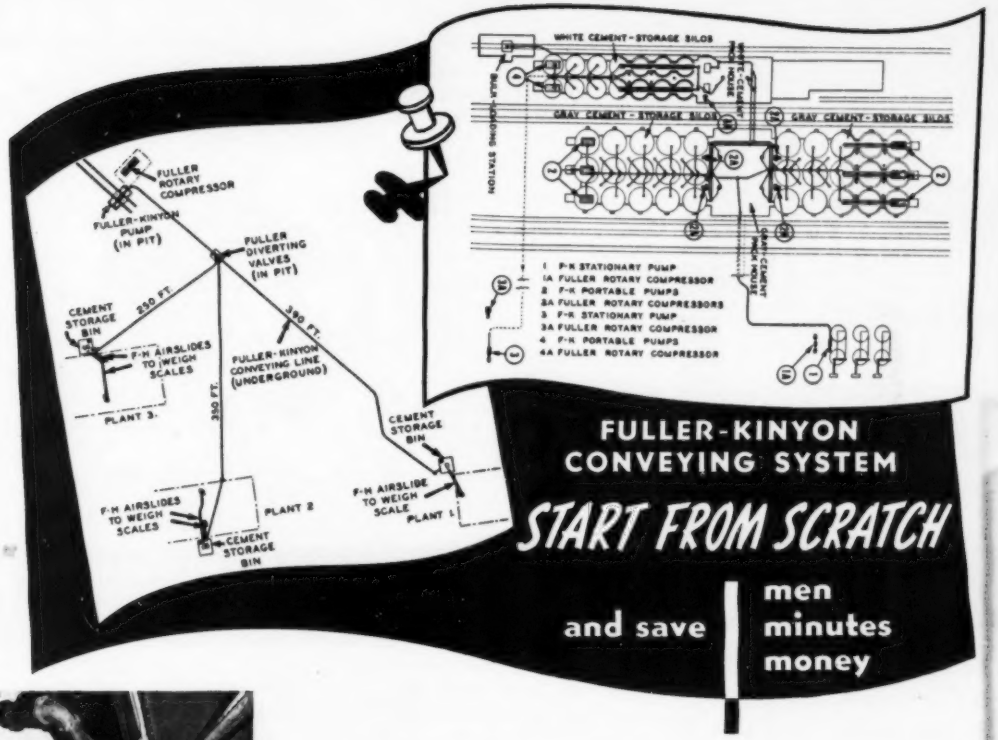
Euclids are standard equipment in many leading open pit mines and quarries, and on construction and industrial work. Owners know that Euclid staying power and continuous operation result in more loads hauled in less time at lower cost.

Ask your Euclid distributor for data on quarry or open pit jobs similar to yours. There is a Euclid to meet your requirements for off-the-highway hauling work.

Rear-Dump Euclids—Capacity from 10 to 34 tons—diesel engines from 125 to 400 h.p., spring mounted or semi-rigid drive axles—top speed loaded up to 35.7 m.p.h.

MORE LOADS PER HOUR— MORE PROFIT PER LOAD

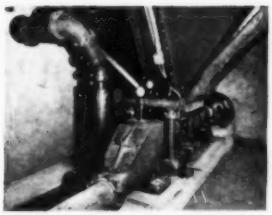
The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio



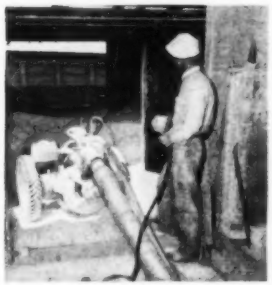
FULLER-KINYON CONVEYING SYSTEM

START FROM SCRATCH

and save | men minutes money



Fuller-Kinyon Stationary Pump conveying from bin.



Fuller-Kinyon Unloader unloading from box car.

The best way to solve any problems of conveying dry pulverized and granular materials is to "Start From Scratch". By that we mean, get all the facts on pneumatic conveying systems while you are still in the planning stage . . . either when building a new plant or modernizing an old one. Pneumatic conveyors permit economy and convenience in location of buildings and production equipment without the restrictions or straight-line limitations of mechanical conveyors. The layout of the conveying system can be designed to meet the specific requirements of the job, to conform exactly to local conditions, to insure minimum cost for erection, maintenance, and supervision.

Right there is where Fuller comes into the picture. As engineers and builders of four basic types of pneumatic conveying systems, Fuller is able to provide the exact system best suited to individual requirements.

Shown here is the Fuller-Kinyon System for conveying dry pulverized materials. It has many advantages: conveying pipe lines can be located anywhere—underground, suspended on simple hangers overhead, vertically, around corners, over long distances, and to practically any number of delivery points. There are no mechanical or explosion hazards. Conveying is clean, fast, and at minimum cost per ton of material handled.

We invite you to have Fuller Engineers make a complete survey and study of your plant plans—investigate local conditions and the material to be handled. Then they will make recommendations as to the system best adapted to your needs—enable you to save time, money, and material by having both plant and system built at the same time. To consult them places you under no obligation.

FULLER COMPANY, Catasauqua, Pa.

120 So. LaSalle St., Chicago 3 420 Chancery Bldg., San Francisco 4

P-130

Fuller

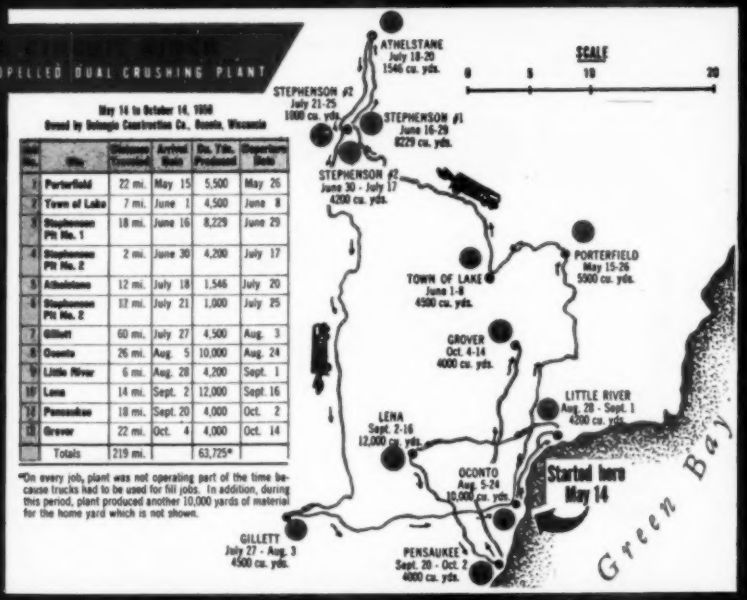
DRY MATERIAL CONVEYING SYSTEMS AND COOLERS — COMPRESSORS AND VACUUM PUMPS — FEEDERS, AND ASSOCIATED EQUIPMENT

LIPPMANN SELF PROPELLED DUAL CRUSHING PLANT

Works 12 pits in 5 months

DRIVES 219 MI. HITS 1100 YARDS PER DAY

with *Circuit Rider*



May 14 to October 14, 1950
Owned by Belongia Construction Co., Oconto, Wisconsin

No.	Site	Distance Traveled	Arrival Date	Cu. Yds. Produced	Departure Date
1	Porterfield	22 mi.	May 15	5,500	May 26
2	Town of Lake	7 mi.	June 1	4,500	June 8
3	Stephenson Pit No. 1	18 mi.	June 16	8,229	June 29
4	Stephenson Pit No. 2	2 mi.	June 30	4,200	July 17
5	Athelstane	12 mi.	July 18	1,545	July 20
6	Stephenson Pit No. 2	12 mi.	July 21	1,000	July 25
7	Gillett	60 mi.	July 27	4,500	Aug. 3
8	Oconto	26 mi.	Aug. 5	10,000	Aug. 24
9	Little River	6 mi.	Aug. 28	4,200	Sept. 1
10	Lena	14 mi.	Sept. 2	12,000	Sept. 16
11	Pensaukee	18 mi.	Sept. 20	4,000	Oct. 2
12	Grover	22 mi.	Oct. 4	4,000	Oct. 14
	Totals	219 mi.		63,725*	

*On every job, plant was not operating part of the time because trucks had to be used for fill jobs. In addition, during this period, plant produced another 10,000 yards of material for the home yard which is not shown.

SELF-PROPELLED CRUSHING PLANT

Belongia Construction Co. Easily Covers 60-Mile Radius Around Oconto, Wis. with Lippmann Self-Propelled Dual Crushing Plant. Read How You, Too, Can Move Ahead to Greater Profits!

Just think of it! You're working in a pit . . . the job is almost done . . . and you've a chance for another job 50 miles away, but it's a tight schedule.

How would you like to climb into a *self-propelled* crushing plant . . . pull out of the pit . . . drive onto the highway . . . and wheel along to the next job *at 18 mph?*

Then picture yourself driving into the new pit in your Lippmann Circuit Rider . . . and *four minutes* after you leave the highway, you're loading a truck with stone.

Nice profitable picture, isn't it?

And that's just what Belongia Construction Co., Oconto, Wis., does with their Self-Propelled Lippmann Circuit Rider, the complete, all-in-one dual crushing and screening plant.

HITS 1100 YARDS PER DAY!

Turning out ¾ in. stone, they consistently were able to hit 1100 yards in an 8-10 hour day. Because in the pit, Circuit Rider easily follows the shovel — there are no separate bins, conveyors or engines to set up and adjust . . . no jacking, leveling or excavating necessary on the plant itself.

Check the "log" of this typical Lippmann Circuit Rider owner above. See for yourself why leading operators find it pays to own the only self-propelled dual crushing and screening plant on the market today.

2005

You can put yourself in this picture— Belongia shovel-feeds self-contained Circuit Rider from one end, discharges into trucks at the other.

LEW

FOR ALL THE FACTS on the complete Lippmann line for pits, mines and quarries write for: Grizzly King Jaw Crushers (Bulletin 1100), Screen-All Vibrating Screens (1200), Pulverizers (1160), Belt Conveyors (1400), Gyra-Gnome Secondary Crushers, Circuit Rider Self-Propelled Crushing Plants, Portable Washing Plants, Apron Feeders (1450).

LIPPMANN ENGINEERING WORKS

4603 West Mitchell St., Milwaukee 14, Wisconsin

Amateur standing ...in need of an expert!

THE selection of the RIGHT BAG for your product is also a subject which may require the attention of an expert. Your Chase Salesman is technically trained to analyze your needs and specify the container which will best protect your product, which will assure the best acceptance of your product. He will be glad to be of service to you. Why not call him in . . . today?

CHASE since 1847 BAGS

BAGS FOR ALL INDUSTRY AND AGRICULTURE

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- paper and Multiwall bags
- Saxolin open mesh bags
- Tapmill burlap bags
- combination bags, liners and specialties

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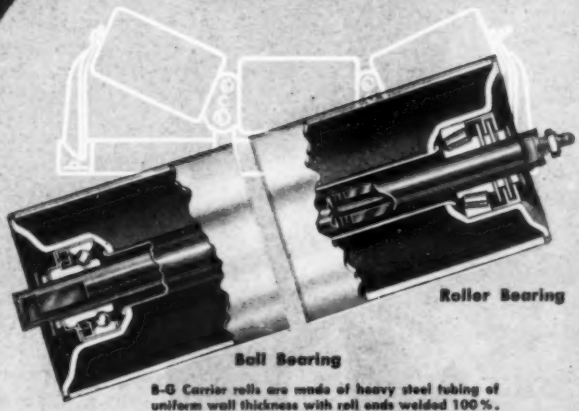
A double check THAT SINGLES OUT B-G BELT CARRIERS

BUILT FOR LO[illegible] BELT LIFE, LESS CARRIER MAINTENANCE...

Check the B-G Belt Carrier design and you'll find a combination of features that means long, low-cost service. Carrier rolls, for instance, stand out under rigid comparison: ¾" shafts . . . large, high-capacity ball or roller bearings . . . 100% welded and finished hubs . . . labyrinth grease seal . . . all are evidence of highest quality manufacture. Rolls are mounted on a heavy angle steel base with built-in 2° tilt for automatic belt training to assure continued accurate belt alignment and minimum belt wear.

If you are faced with Belt Carrier replacement — if you're thinking of a new belt conveyor — get the [illegible] story on how Barber-Greene Carriers will stay true and smooth [illegible] through more years of service.



B-G Carrier rolls are made of heavy steel tubing of uniform wall thickness with roll ends welded 100%.

OVER 80 STOCKING DISTRIBUTORS

Rolls are mounted on all steel, jig-welded self-shedding angle.

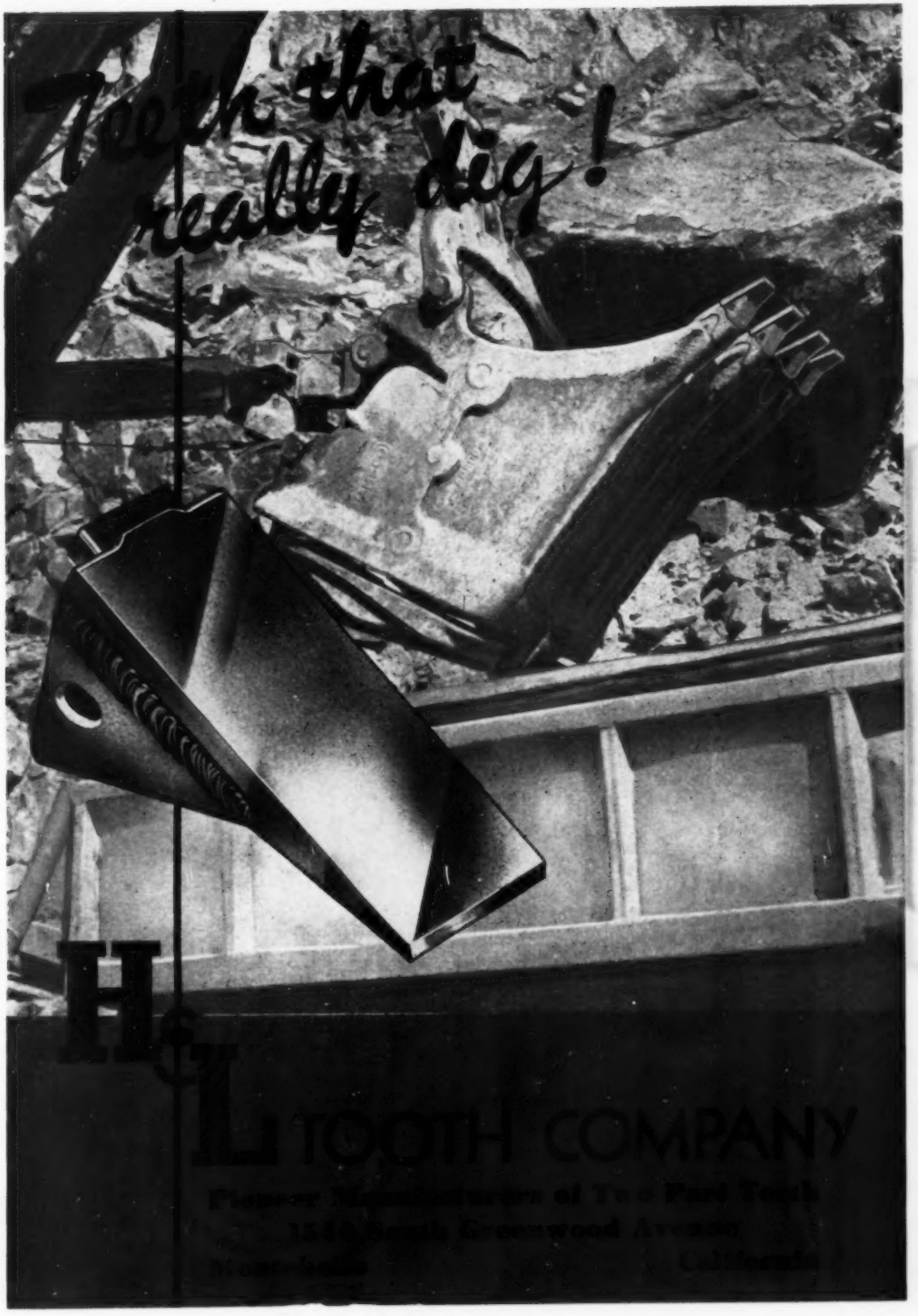
Also, fast, reliable B-G Distributor service can help prevent shutdowns and minimize time lost when conveyor trouble occurs — many carry B-G Belt Carriers in stock, available for fast delivery.

Your B-G Distributor offers carriers in three roll diameters (4", 5", 6")—and in 18", 24", 30", 36" and 42" widths. These as well as impact and self-aligning B-G Carriers are fully described in Catalog 76C. Write for your copy.

201

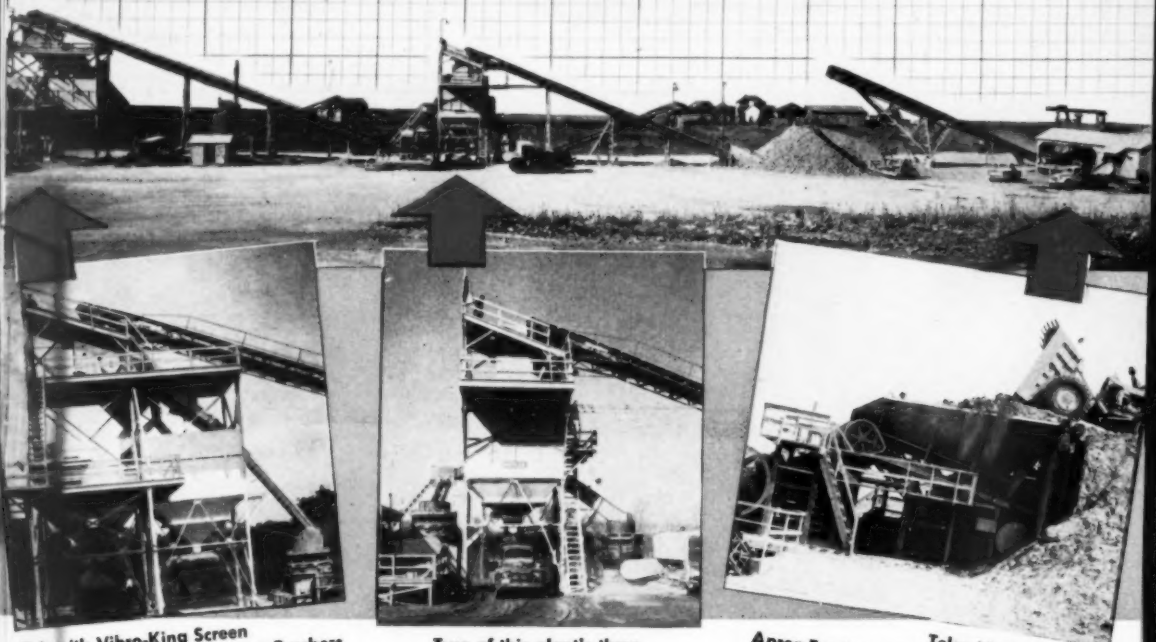
Barber-Greene

AURORA, ILLINOIS


Teeth that really dig!
H
TOOTH COMPANY

ENGINEERED by TELSMITH

TO PRODUCE 300 T.P.H. FOR NELLO L. TEER CO.



Telsmith Vibro-King Screen and one of three Gyrasphere Crushers

Two of this plant's three Telsmith Gyrasphere Crushers

Telsmith Heavy-Duty Apron Feeder feeds 30″x42″ Primary Jaw

TELSMITH Equipment in this plant

- One (1) 42″ x 14′ Heavy-Duty Apron Feeder
- One (1) 36″ x 6′ Heavy-Duty Plate Feeder
- One (1) 5′ x 12′ Pulsator Double Deck Scalping Screen
- One (1) 489 Special Coarse Gyrasphere Secondary Crusher
- Two (2) 48 Fine Crushing Gyrasphere Tertiary Crushers
- One (1) 5′ x 12′ Vibro-King Triple Deck Finishing Screen
- One (1) 20″ x 15′ Twin Screw Classifier
- Five (5) Telsmith-BG Conveyors, 18″ to 30″ wide, 72′ to 150′ long

● Large capacity of hard and abrasive granite, crushed to small sizes, features this Durham, North Carolina quarry plant. Telsmith-engineered-and-equipped to fit local conditions, it produces minus 1½″ traffic-bound macadam, minus ¾″ stone for asphalt plant, and minus 2½″ concrete stone; all meeting North Carolina State Specifications, and used in black-top plants and for roads and concrete construction.

Reliable tests show a capacity of about 300 tons per hour of minus 1½″ including about 70 tons per hour of minus ⅜″ asphalt stone; or, about 170 tons per hour when producing all minus ¾″ stone. Its three (3) Telsmith No. 48 Gyrasphere Crushers are responsible for this high capacity of small sized products.

Take your aggregate production problems to Telsmith Engineers. Send for Bulletin 266. Q-23

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17, N. Y. • 211 W. Wacker Drive Chicago 6, Ill. • 713 Commercial Trust Bldg. Philadelphia 2, Pa. • 238 Main Street Cambridge 42, Mass. • Bonbck Eqpt. Co. Milwaukee 3, Wis. • A. N. Wigle, 294-6 N. Roosevelt Ct. Columbus 9, Ohio

Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Interstate Equipment Co., Statesville, N. C.

Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 16, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

Built in Light, Medium and Heavyweight sizes . . . the larger models drill to as much as 45' depths, using steel changes up to 15'—the Medium has "Hydra-Lift" hydraulic control.

FASTER, LOWER-COST DRILLING!

JOY *Lightweight* WAGON DRILLS

THE EXCLUSIVE "DRILL AND BLOW" FEATURE MEANS YOU BLOW THE HOLE AS YOU DRILL!

- ★ **LIGHTWEIGHT only 750 lbs.**
- ★ **EASY ONE MAN HANDLING**
- ★ **FINGER-TIP CONTROL**
- ★ **POSITIVE LOCKING BRAKES**

WRITE FOR BULLETIN, OR

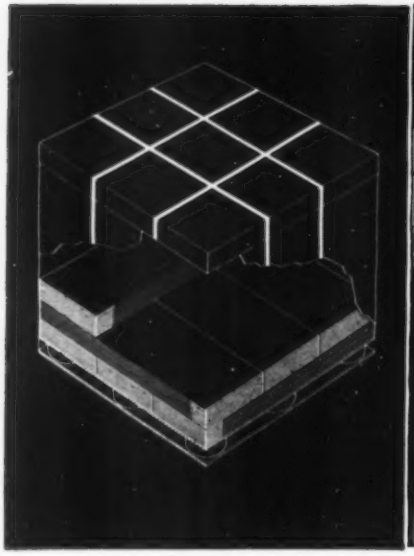
Consult a Joy Engineer

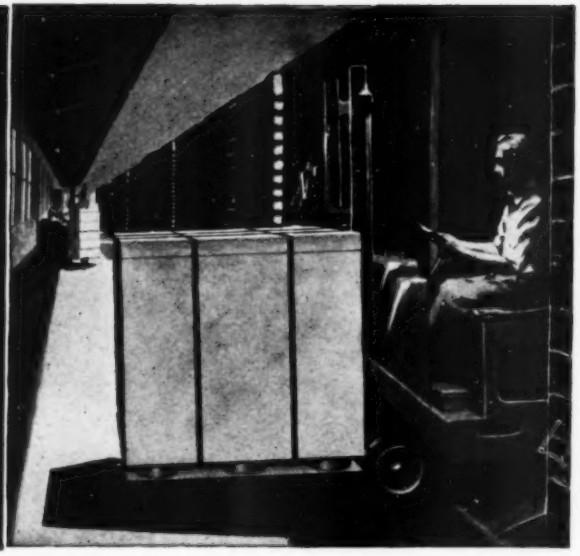
W&D C 2817

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO





Your

Union Multiwall Specialist

will show you how to make Handling Labor more productive

ONE of the hidden costs in packaging is in the handling of packaging materials from unloading dock to warehouse to packaging assembly line.

Thanks to new ways of shipping and handling, many firms now find savings in handling costs alone more than justify a switch to Union Multiwall Bags. The Union Multiwall Specialist who calls on you, can tell you all about the recent cost-cutting developments in handling of multiwall bags.

He'll show you, too, why more than 300 industries now find Union Multiwall Bags cut packaging costs all along the line—in handling, packaging, shipping—yes, and in better product protection, too.

Even if you're now using multiwall bags, the Union representative who calls on you can give you new ideas to save money. For he is backed by the skilled engineers and packaging experts of America's largest maker of paper bags.

Let him show you how Union resources and packaging experience can help you!

Multiple Protection

Opens Easily

Prevents Siftage

Empties Clean

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Offices in: CHICAGO, ILL. • MINNEAPOLIS, MINN. • KANSAS CITY, MO. • HOUSTON, TEXAS • BALTIMORE, MD. • ATLANTA, GA.

WORLD'S LEADING TRUCK SHOVEL

THE ONE AND ONLY "QUICK-WAY"

Reg. U. S. Pat. Off.

QUICK-WAY truck shovels can be found "on the job" in every one of the 48 states and in 65 foreign countries as well.

Yes . . . *QUICK-WAY* . . . the original and always the standard among truck shovels, demonstrates its versatility and adaptability, as well as its superb engineering and long-lasting construction, in Alaska and the Amazon, Great Britain and British Columbia.

Abroad, as well as at home, *QUICK-WAYS* get to and from the job faster. They're on the job more, because they're "between location" less. And *QUICK-WAYS* are quickly converted in minutes from shovel to scoop, dragline, trench-hoe, crane, clamshell, pile driver or backfiller. And most important of all, *QUICK-WAYS* are built for long, hard service with quality materials and superior workmanship. They're truly an investment in profits.

Mail Coupon Today!

"QUICK-WAY"
TRUCK SHOVEL CO.

DENVER, COLORADO

U. S. A.

"QUICK-WAY" TRUCK SHOVEL CO.
Dept. 14 – 2400 East 40th Ave.
Denver, Colorado

Please send me complete details on "QUICK-WAY" truck shovels — four different models for large jobs and small.

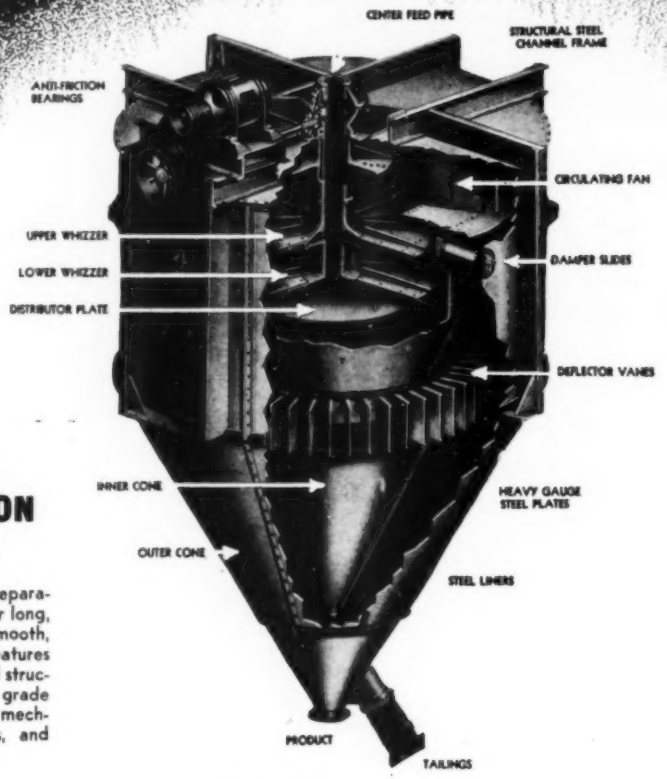
NAME _____

ADDRESS _____

CITY _____ STATE _____

Raymond WHIZZER SEPARATION

. . . produces all grades



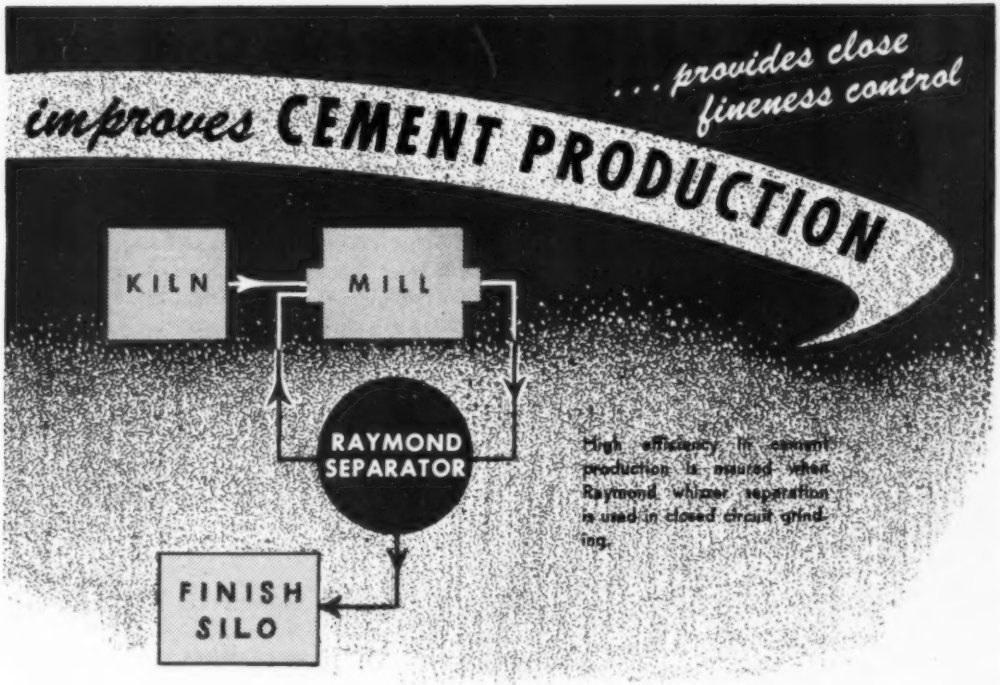
SUPERIOR CONSTRUCTION FEATURES

Raymond Mechanical Air Separators are dependably built for long, economical service and smooth, vibrationless operation. Features of these units include rugged structural steel framework, high grade bearings, extra sturdy drive mechanism, heavy gauge plates, and hardened liners.

COMBUSTION ENGINEERING

Raymond

PULVERIZER DIVISION


improves CEMENT PRODUCTION
. . . provides close fineness control
KILN
MILL
RAYMOND SEPARATOR
FINISH SILO
High efficiency in cement production is assured when Raymond whizzer separation is used in closed circuit grinding.

Raymond whizzer separation has proved outstandingly successful in the cement field for classifying both raw cement mix and cement clinker.

Close control is assured over the specific surface area of the finished cement and consistent finished materials are made at any surface area specification. With the proper setting of the separator it may be adjusted externally while in operation for any required surface area specification.

The overall economy of Raymond Separators is due to minimum power requirements with record low operating and maintenance costs . . . plus greatly increased grinding mill capacity.

Write for Raymond CATALOG No. 58

containing full details of Raymond Mechanical Air Separators, and their applications in making cement, gypsum, chemicals and manufactured products.

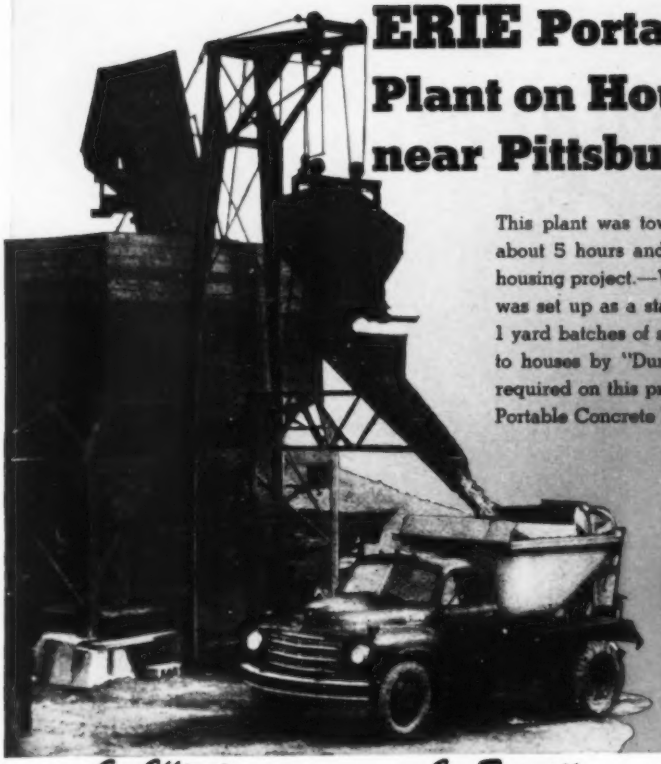
– SUPERHEATER, INC.

1321 North Branch St., Chicago 22, Illinois

Sales Offices in Principal Cities

SINCE 1887

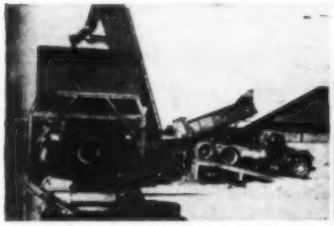
ERIE Portable Concrete Plant on Housing Project near Pittsburgh



This plant was towed from Erie to Pittsburgh in about 5 hours and set up on the site of a large housing project.—Wheels were removed and plant was set up as a stationary concrete mixing plant. 1 yard batches of specification concrete delivered to houses by "Dumpcrete" trucks. All concrete required on this project was provided by this Erie Portable Concrete Plant.

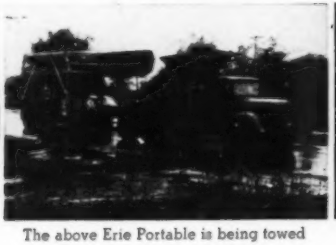
Move Your **CONCRETE PLANT** *from Job to Job and produce up to* **40 CU. YARDS PER HOUR**

In Illinois



This Erie Portable Concrete Plant, electric motor driven, is set up in a town of 10,000 population to supply concrete within a 16 mile radius. Steam heating makes it possible to operate all year and sales up to 100 yards a day are recorded without taxing the full capacity of the plant.

In Transit



The above Erie Portable is being towed 100 miles to make concrete on a series of building projects. 2 men can get it into operation within 60 minutes and it can be "knocked down" for towing in less time. Booklet SP1 gives complete specifications. Write for copy.

In New York

This Erie Portable Concrete Plant is completing here a 6000 cu. yard concrete job and has since been moved to three building sites in Buffalo. Consult with Erie for complete details on the Erie Portable Concrete Plant as applied to your concrete project.

ERIE

STEEL CONSTRUCTION COMPANY

611 GEIST ROAD • ERIE, PENNSYLVANIA

to STEEL USERS!

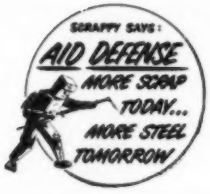
Unless dwindling scrap piles are replenished immediately, steel production will suffer. *Extra* scrap is needed—above and beyond the "working" scrap which steel users regularly sell.

Comb YOUR Plant!

How much valuable scrap do *you* have just lying around? Old machines and equipment . . . useless parts . . . odds and ends. This is the kind of scrap that's urgently needed now. It will get more steel for everybody.

Here's a Quick Way-

Put *one* man in charge of getting all the scrap in your operation collected and turned over to your scrap dealer. Set the date for the job to be done.



Do it NOW!

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PA.

. . IT HIGHLIGHTS A *Better Way* TO KEEP AMERICA STRONG

Machines are America's strength. How to preserve it in a national emergency? One way is to keep replacing. A better way is — *proper maintenance!*

The Harnischfeger Corporation and its dealers across the nation are preaching one doctrine: *maintenance.* Pointing out it takes far less steel, far fewer man-hours than building new. It curbs the breakdowns which sap our strength. It makes machines work longer, for less—and the savings add to our power.

Practice what they preach? P&H dealers are busy renewing old machines, speeding up service calls, protecting users against costly layups. The company has tripled the stocks of genuine P&H repair parts. It is devoting an entire plant to these alone—and a network of branch offices and warehouses to speed them where they're needed.

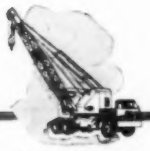
Now, through National Service Week, Harnischfeger Corporation and its dealers seek to expand *service* from a company policy to a national goal. For if production makes America strong, only service can keep it strong—*there is no better way.*

P&H
QUALITY
FOUNDED IN 1884
SERVICE
HARNISCHFEGER
CORPORATION

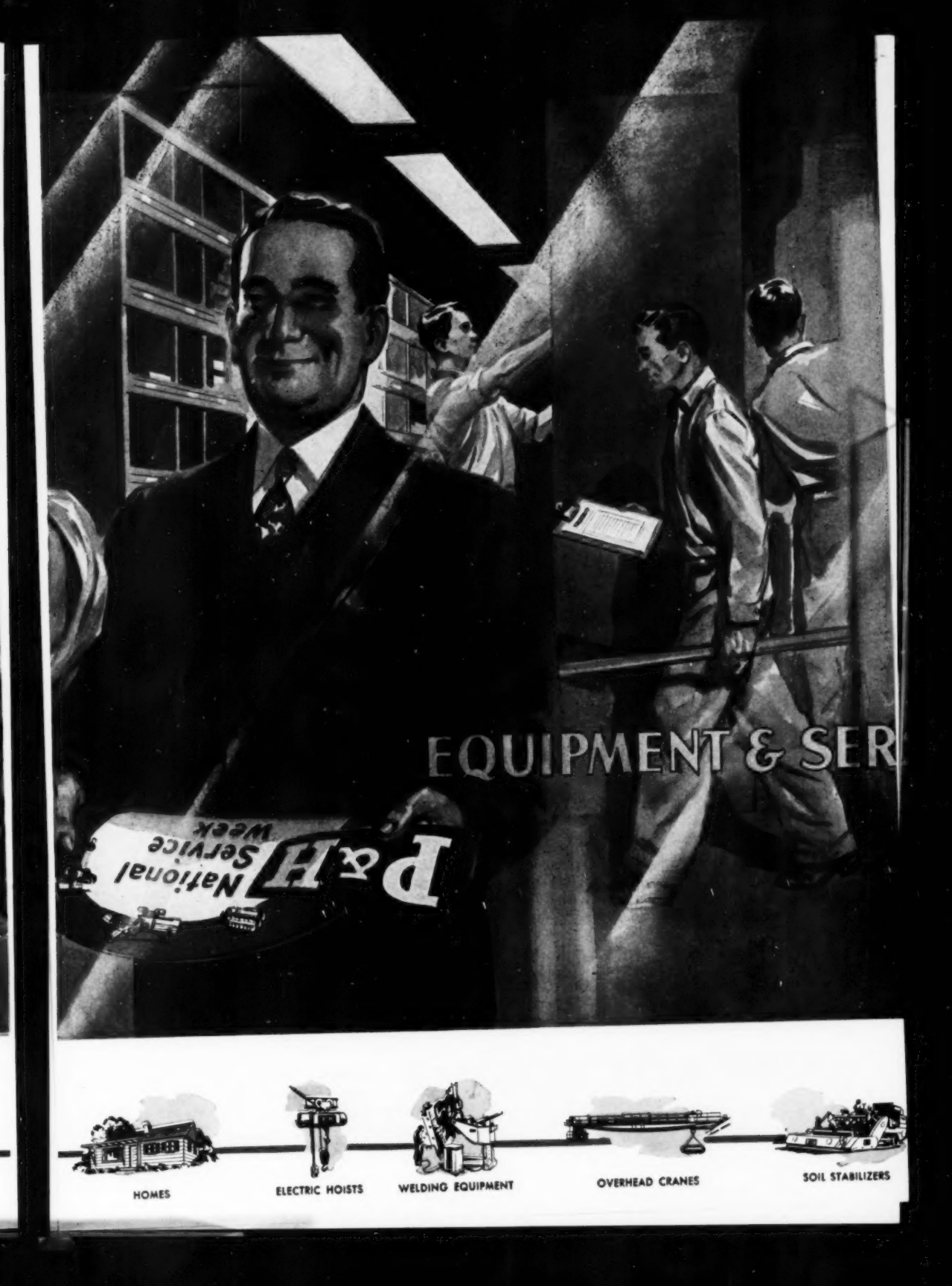
the P&H *Line*

POWER SHOVELS

DIESEL ENGINES



TRUCK CRANES


EQUIPMENT & SER
P&H
National
Service
week
HOMES
ELECTRIC HOISTS
WELDING EQUIPMENT
OVERHEAD CRANES
SOIL STABILIZERS

Their first LINK-BELT SPEEDER sold them 15 more!

One of the many reasons why Blue Diamond Corp. has standardized with Link-Belt Speeders — *they have the stamina to stand up in heavy digging such as this* at their Nevada gypsum quarry.

For 30 years...

BLUE DIAMOND CORP.

has standardized on LINK-BELT SPEEDERS

LINK-BELT SPEEDER

From the early 20's when they started in business with their first Link-Belt Speeder, the Blue Diamond Corporation (home office, Los Angeles, Cal.), has made steady progress. Today they are rated one of the country's largest producers of basic materials and manufacturers of wall board.

To keep pace with this progress, more and more Link-Belt Speeders have been put into service to handle this ever-increasing volume. High praise for the remarkable freedom from adjustment and down time, so characteristic of Link-Belt Speeders.

Electric-powered Link-Belt Speeder heavy-duty shovels at work in a gravel deposit.

Crawler mounted Link-Belt Speeders filling a Redi-Mix concrete plant.

Self-propelled, rubber-tired Link-Belt Speeders used for aggregate loading.

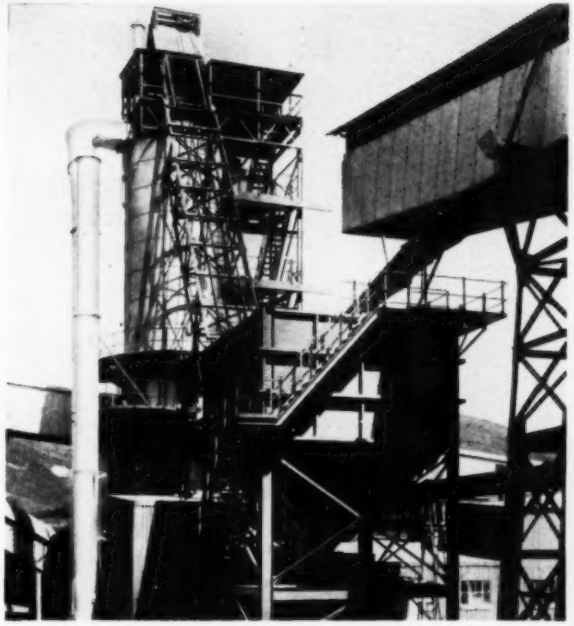
LINK-BELT SPEEDER
CORPORATION

Builders of the most complete line of shovels, cranes and draglines
CEDAR RAPIDS, IOWA

12.570

DESIGNED *to Improve Lime Production*

Priest VERTICAL LIME KILN



Recent installation of a 100 ton Priest Vertical Kiln at Steel Co. of Wales plant near Port Talbot. Fuel—Blast furnace gas.

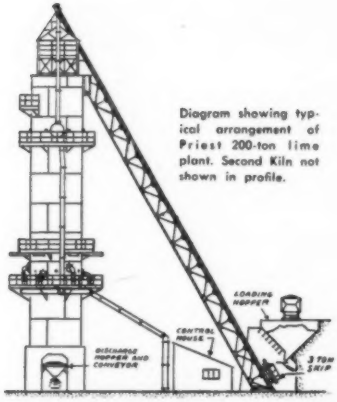


Diagram showing typical arrangement of Priest 200-ton lime plant. Second Kiln not shown in profile.

The Priest Shaft Type Lime Kiln comes to American industry with a superb record of performance in scores of successful installations throughout the European field.

This Kiln is a development of Priest Furnaces Ltd. of Middlesbrough, England, in collaboration with Dr. N. V. S. Knibbs.

Its outstanding feature is the *patented water-cooled burner*, which maintains even fuel distribution and assures record output of top quality lime.

Priest Kilns are compact, completely mechanized, and operate automatically. Other features contribute to the unique efficiency records established by Priest Kilns:

- **Low Fuel Costs**
- **High Quality Product**
- **Flexibility**
- **Low Maintenance**
- **Minimum Down Time**
- **Automatic Control**
- **Moderate Power Requirements**
- **Low Labor Costs**

Complete Information Sent on Request

HOLBECK CORPORATION LTD. ENGINEERS AND CONTRACTORS
TORONTO • ONTARIO • CANADA

NOPCO ERTRANE C

MEETS ALL REQUIREMENTS OF ASTM SPECIFICATION C226-50T

—which means that it is a fully accredited air-entraining agent for use in the manufacture of air-entraining cement made in conformance with:

ASTM SPECIFICATION C175-50T

(the specification that reflects the current policy of Committee C-I, as adopted on September 26, 1950)

Ertrane C has been subjected to rigid tests in the qualified laboratories of E. L. Conwell & Co., Philadelphia, and has met all eight requirements of C226-50T in regard to its effect on the properties of portland cement — actually *surpassing the required standards by impressive margins in virtually every instance.*

Here are some of the important results obtained (using test specimens made and cured as specified in ASTM C192-44T):

Compressive Strength of Concrete, p.s.i. — 6" x 12" cylinders				
Cement Content	**Type Cement**	**After 1 Year (av. for 3 tests)**	**% Strength of Concrete made with cement using Ertrane C**	
4.0 Bag Mix	I	3650		
	IA	3570	98%	
	II	3290		Requirement: 85% min.
	IIA	3030	92%	
	III	3785		
	IIIA	3375	89%	
6.0 Bag Mix	I	5085		
	IA	5005	99%	
	II	4640		Requirement: 85% min.
	IIA	4330	94%	
	III	5185		
	IIIA	4700	91%	

NOPCO
EVOLVED THRU RESEARCH

NOPCO CHEMICAL COMPANY

Branches: Boston • Chicago

Flexural Strength of Concrete, p.s.i.—3" x 4" x 16" beams				
Cement Content	Type Cement	After 6 mos. (av. for 4 tests)	% Strength of Concrete made with cement using Ertrane C	
4.0 Bag Mix	I	625		
	IA	638	102%	
	II	725		Requirement: 85% min.
	IIA	650	90%	
	III	810		
	IIIA	735	91%	
6.0 Bag Mix	I	775		
	IA	788	102%	
	II	888		Requirement: 85% min.
	IIA	863	97%	
	III	1025		
	IIIA	900	88%	

Resistance to Freezing and Thawing

Test specimens: 3" x 4" x 16" beams—5.5 bags of cement per cu. yd.

Specimens cured 28 days moist, and 48 hours immersed in water at 73.5°F. Completely immersed in water during freezing and thawing cycles.

10 cycles per day automatically controlled 0°F. to 40°F.—center of specimen temperature recorded.

Per Cent Change in Dynamic Modulus Cycles (average 3 beams)								
Cement	25	50	75	100	125	150	200	Flexural Strength (one beam)
I	4	7	13	18	24	28	49	358
IA	1	2	2	4	5	6	8	563
II	2	6	16	26	32	36	44	420
IIA	2	2	5	9	10	10	11	630
III	6	15	15	21	29	40	51	400
IIIA	5	5	6	7	7	9	10	672

● **All the foregoing results prove conclusively that air-entraining portland cement employing Nopco Ertrane C assures concrete of good *strength* and *excellent durability*.**

LOOK AT THESE ADVANTAGES

In addition to imparting *excellent durability* to concrete, Ertrane C affords outstanding advantages to both the cement manufacturer and the cement user. For example:

EASY, ECONOMICAL HANDLING. It is only necessary to add Ertrane C to water and stir until dissolved. No control testing required. Result: Considerable savings in time and labor at the mill.

IMPROVED PLASTICITY. Ertrane C provides durability and plasticity (through air formation), and also imparts highly desirable qualities that *increase workability and placeability.*

IMPROVED WATER REPELLENCY AND STORAGE LIFE. In view of its composition, Ertrane C gives *more water repellency* than straight resin soaps. This characteristic helps to prevent cement from caking in storage.

GOOD COST/PERFORMANCE RATIO. On a cost/performance basis, Ertrane C is more *economical* than any air-entraining agent on the market.

Ertrane C is immediately available, in any quantity, from Nopco's plants at Harrison, N. J., Chicago, and Cedartown, Ga.

Fill out the attached coupon. We shall gladly send you full information, and make recommendations based upon your particular requirements.

Harrison, New Jersey

Cedartown, Ga. • Richmond, Calif.

NOPCO CHEMICAL COMPANY
Harrison, New Jersey

Gentlemen:

I am interested in learning more about Ertrane C. Will you kindly—

☐ send me further details—including full report of tests made by the E. L. Conwell Co. laboratories.

☐ have your representative call.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

BUCYRUS-ERIE
EXTRA VALUES MEAN

Dependable High Output

Big, dependable yardages are "standard equipment" for Bucyrus-Erie excavators, as owners and operators the world over will testify. The superior performance records of Bucyrus-Erie result from fast, smooth operating cycles and on-the-job reliability for peak output every shift . . . *plus* the extra values of soundly engineered design and durable construction available only to Bucyrus-Erie as a result of its unmatched experience in the construction of quality excavating machinery.

142L51

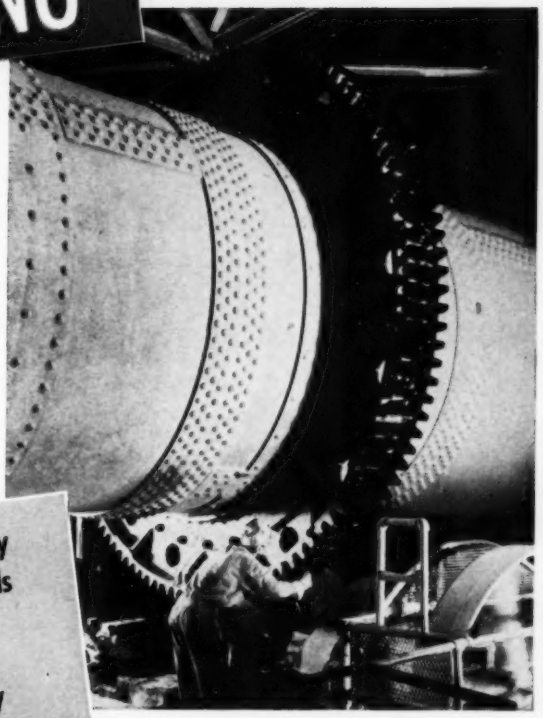
BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

ANNOUNCING

the new improved Gulf Lubcote

–provides better lubrication for open gears and wire rope



- stays on — outstanding tenacity
- reduces wear — cuts repair bills
- prevents corrosion
- helps keep equipment running smoothly and quietly

Widely accepted for years as the ideal lubricant for open gears and wire rope, Gulf Lubcote has now been further improved. Greatly increased adhesiveness makes it even more resistant to throwoff and channeling.

Because of its outstanding lubricating qualities, Gulf Lubcote provides maximum protection against wear.

And since its lubricating film is resistant to moisture, fumes, and gases, it prevents corrosion and pitting of metal surfaces. The tough Gulf Lubcote film also withstands extreme temperature changes without drying, cracking, or peeling.

Gulf Lubcote is ideal for noisy open-gear drives —cushions the sliding and rolling action of gear teeth, reducing noise and contributing to worker efficiency.

Gulf Lubcote is available in a range of viscosities and consistencies. Selection of the proper grade depends on type of equipment, operating conditions, and method of application. Ask the Gulf Lubrication Engineer for his recommendation. Or send the coupon below for further information.

FIFTY YEARS OF SERVICE
1901 GULF 1951
PETROLEUM AND ITS PRODUCTS

Gulf Oil Corporation · Gulf Refining Company P.xQ
719 Gulf Building, Pittsburgh 30, Pa.

Please send me, without obligation, a copy of your pamphlet "Gulf Lubcote."

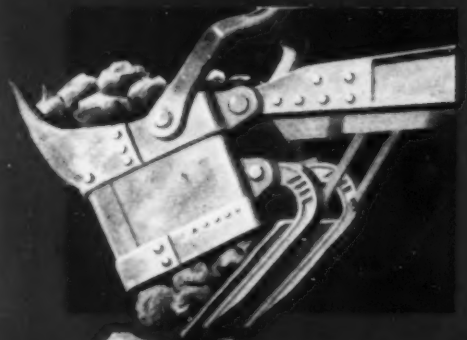
Name .....

Company .....

Title .....

Address .....

Quarrymen:



produce more tons per hour . . . blast with

Detonite!

King Detonite is the improved, patented high explosive that is *unique* in the quarrying field. Detonite shoots with a s-l-o-w, heaving action that results in *better* breakage. You'll have *less* secondary drilling and shooting; your shovels will be able to dig at high capacity; your total plant operating costs will go *down*.

WANT PROOF OF THESE CLAIMS?

Let us demonstrate King Detonite in your quarry. You'll see for yourself how Detonite does a better blasting job. All you need do is write or phone us, and we'll arrange a convenient date. Proved by 15 years of continuous use, hundreds of quarries have benefited by standardizing on Detonite. So why don't you profit by arranging for that Detonite demonstration, *today?*

KING EXPLOSIVES

THE KING POWDER CO. INC. CINCINNATI, OHIO INCORPORATED 1878

DETONITE

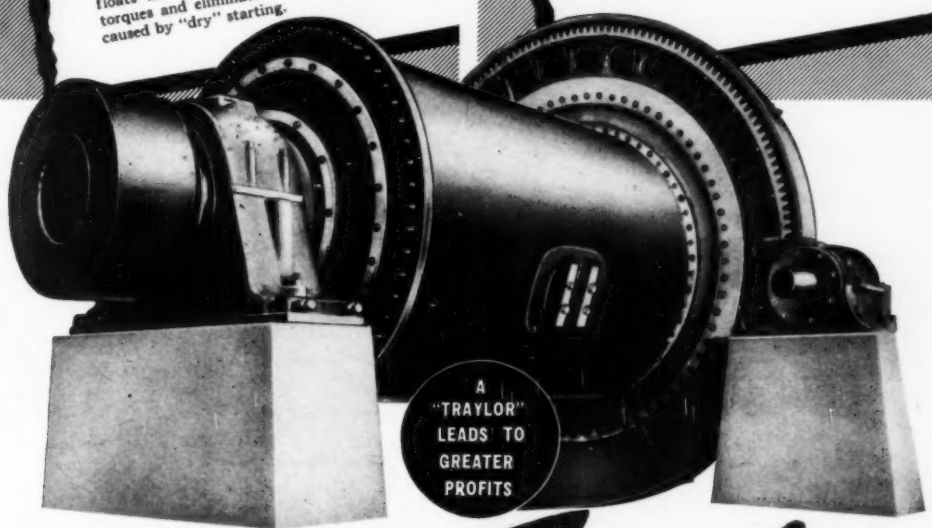
THE PATENTED SURFACE-SENSITIZED HIGH EXPLOSIVE

Here's why a Traylor Ball Mill

needs less maintenance

HEADS are cast steel . . . faced and counter bored to fit shell flanges. Shell is of all welded steel plate construction with heavy flanges welded to each end. Flanges are faced and turned to insure proper alignment with heads. Trunnions are cast integral with the heads, *turned* and *highly polished*. Large trunnion bearings . . . of heavy ball and socket design . . . are continuously lubricated by an internal oil elevator. To save power and reduce bearing wear when starting the mill, a high pressure Alemite pump is fitted to each bearing. This pump coats the trunnion with a film of grease which lifts and floats the mill to overcome high starting torques and eliminate undue bearing wear caused by "dry" starting.

GEARS are important to ball mill operating and maintenance costs. Traylor gears mesh smoothly . . . are less subject to wear . . . minimize power waste. The main gear is furnished in halves. Both this steel main gear and the steel pinion gear are reversible. Using *both sides* of the teeth greatly lengthens gear life. The teeth are generated involute with *high* addendum on the pinion . . . low addendum on the main gear . . . on a Maag Type Automatic Gear Generator. This has been *standard* practice at Traylor for over 25 years.



As your production rate climbs...your need for a Traylor Ball Mill will grow. As your grinding costs increase, so will your need for *more productive* equipment to protect your profits. Traylor Mills are built for *continuous operation...for dependable 24 hour production* with a *minimum* of down time for maintenance. Write today if you have a grinding problem due to increased production requirements. Traylor can show you how to put your grinding operation on a *profitable* 24 hour basis.

Traylor

Rotary Kilns, Coolers and Dryers • Grinding Mills
Jaw, Reduction and Gyratory Crushers • Crushing Rolls

TRAYLOR ENGINEERING & MANUFACTURING CO.

388B MILL ST., ALLENTOWN, PA.

SALES OFFICES: New York, N.Y., Chicago, Ill., Los Angeles, Calif.
CANADIAN MFR., Canadian Vickers, Ltd., Montreal, P.Q.

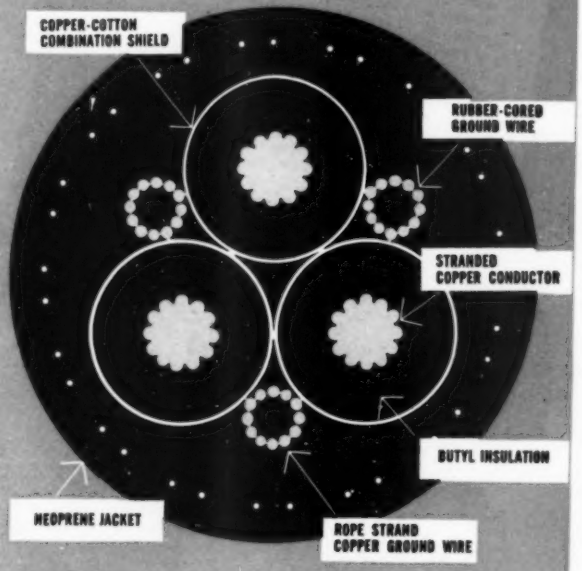
Now BUTYL makes Securityflex High Voltage Shovel Cable better than ever

...And here's why:

New BUTYL INSULATION provides
- higher dielectric strength
- higher moisture resistance
- higher resistance to damage by compression
- much higher resistance to heat

New COPPER-COTTON SHIELD means
- no chafing failures
- faster, easier splicing

Patented RUBBER-CORED GROUND WIRES
- will not kink
- have large diameters, greater contact with conductor shield
- are cushioned, won't cut insulation



Idleness of big shovels through cable failure means big losses. Anaconda's new BUTYL-insulated SECURITYFLEX* Type SH-D High-Voltage Shovel Cable means big savings. For more information get in touch with your nearest Anaconda Sales Office or Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

845579

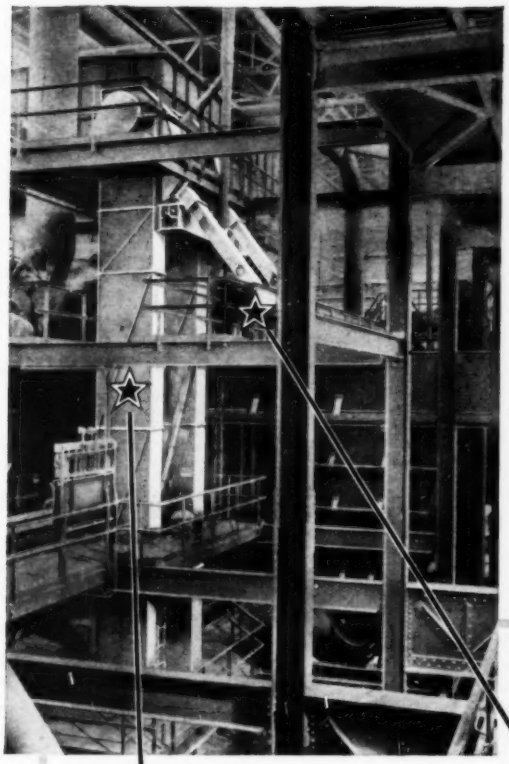
The right cable for the job ANACONDA®

WIRE AND CABLE

*Reg. U. S. Pat. Off.

MATCH YOUR JOB of Materials Handling...

with LINK-BELT Bucket Elevators and Screw Conveyors



LINK-BELT offers you the most diversified line of both . . . plus wide engineering experience

MOVE bulk materials with top efficiency. Choose your bucket elevators and screw conveyors from the complete Link-Belt line . . . engineered to meet your exact requirements.

For maximum results — different materials and varying conditions require specific types of materials handling equipment. That's why Link-Belt builds many types and sizes of enclosed conveying equipment . . . the *widest range* of bucket elevators and screw conveyors.

When you need bucket elevators or screw conveyors . . . choose them from the most diversified quality line on the market. Call in Link-Belt, the world's leading manufacturer of elevating and conveying machinery.

Steel-encased continuous Link-Belt Bucket Elevators deliver smooth flow of white-run and dark-run gypsum to Link-Belt Helicoid Screw Conveyors feeding surge bins in wallboard plant.

Continuous bucket elevator delivers high capacities at lower speeds.

Helicoid or Sectional Conveyor Screws — for general screw conveyor applications, — may also be furnished in the metal and finish best suited to your purpose and with components selected from the most complete line.

LINK-BELT

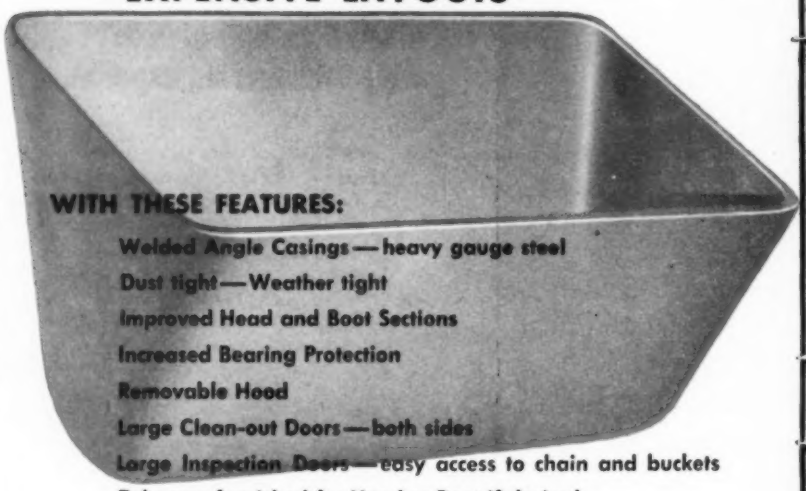
BUCKET ELEVATORS AND SCREW CONVEYORS

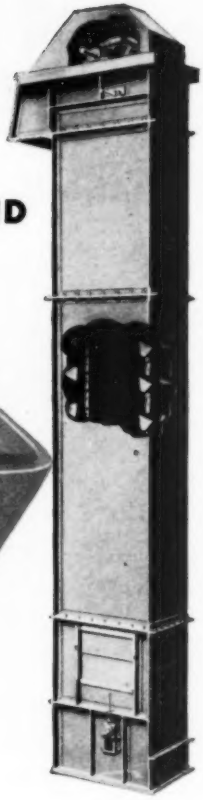
LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in Principal Cities. 12,540

BUCKET ELEVATORS

STANDARDIZED...

TO SAVE YOU MONEY, TIME, AND EXPENSIVE LAYOUTS





WITH THESE FEATURES:

- Welded Angle Casings—heavy gauge steel
- Dust tight—Weather tight
- Improved Head and Boot Sections
- Increased Bearing Protection
- Removable Hood
- Large Clean-out Doors—both sides
- Large Inspection Doors—easy access to chain and buckets
- Take-ups furnished for Head or Boot if desired
- Self-aligning, plain or anti-friction Bearings

You'll be ahead with Jeffrey Bucket Elevators—they're backed by years of engineering experience and hundreds of installations. A standard type and size to meet most requirements—complete drawings available—special designs for unusual applications. We will be happy to give you more details.

Bin Valves Car Pullers Conveyors Crushers Coolers Dryers
Feeders Idlers (belt) Packers Pulverizers Screens Shredders
Weigh-feeders Transmission Machinery

A Jeffrey Centrifugal Discharge Bucket Elevator is shown here. Also Perfect Discharge, Vertical Continuous and Inclined Elevators—buckets mounted on chain or belt—can be supplied in standard sizes.

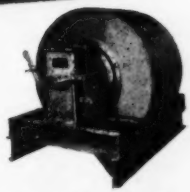
THE JEFFREY MANUFACTURING COMPANY
917 North Fourth St., Columbus 16, Ohio
ESTABLISHED 1877

Complete Line of Material Handling, Processing and Mining Equipment

You Can Cut Today's High Production Costs with STURTEVANT EQUIPMENT

AIR SEPARATOR

For separation of fines to 325 mesh and finer. Increases output from 25% to 300% . . . lowers power costs by 50%. For years, this separator has been the standard in the cement industry.



DUSTLESS BLENDER

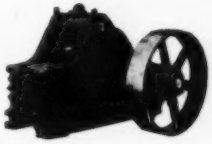
Four-way mixing action assures a thoroughly blended product. Open-door accessibility permits easy cleaning. Available in many mixing capacities for ¼ ton per hour and up.

RING-ROLL MILLS

For medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operate in closed circuit with Screen or Air Separator. Open-door accessibility. Many sizes. No scrapers, plows, pushers, or shields.

SWING-SLEDGE MILLS

For coarse and medium reduction (1" to 20 mesh). Open-door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.



JAW CRUSHERS

For coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.

Sturtevant equipment, such as illustrated, helps you overcome high labor and production costs by increasing output. In addition, their rugged construction assures long life with minimum maintenance. It will pay you to investigate these machines. Write for information.

STURTEVANT MILL COMPANY
104 CLAYTON STREET, BOSTON 22, MASSACHUSETTS

Designers and Manufacturers of: CRUSHERS • GRINDERS • SEPARATORS
CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

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Gentlemen:
Please send me your catalog. I am especially interested in _____

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Here's what WE mean by

EASY TO SERVICE

▶ Allis-Chalmers' new tractor line is blazing the way to simpler servicing with time and money savings never before possible.

▶ Adjustments are easier . . . lubrication simplified and lube periods greatly extended. Mechanics say these are the easiest tractors they have ever worked on!

▶ This all adds up to less down time, more producing time...longer tractor life at less upkeep cost.

▶ Following are just a few reasons why this NEWEST, FINEST TRACTOR LINE ON EARTH is *Easy To Service*...besides being built to "take it," easy to operate and entirely new in performance. Get the full story from your Allis-Chalmers dealer.

TIME-SAVING LUBRICATION DESIGN — Only a few lube points, easy to get at — NONE UNDER TRACTORS. You operate *75 HOURS* without any greasing — then only one fitting to hit and an oil change to make. (Only exception, torque converter bearings on HD-20). You lubricate the Positive-Seal truck wheels, support rollers and idlers only once every *1,000 HOURS!*

ACCESSIBLE ADJUSTMENTS — *QUICKLY MADE* — brakes, master clutch, steering clutches. No floor plates to remove for any adjustments. Tracks easier to adjust — simple screw adjustment with automatic lock.

EASY TO REPAIR — Engine, master clutch, transmission, steering clutches and final drives can be easily removed and repaired or replaced, *without disturbing adjacent assemblies.*

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

The Newest, Finest Tractor Line on Earth!

40.26 drawbar hp.
11,250 lb.

70 drawbar hp.
18,500 lb.

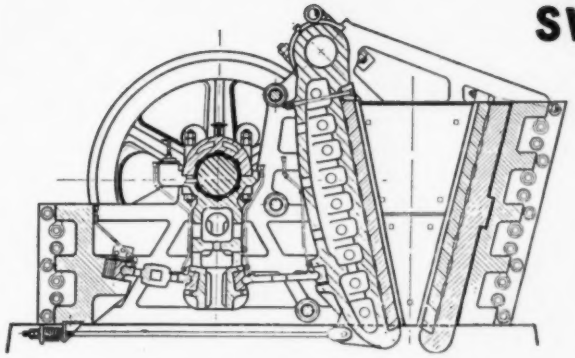
102 drawbar hp.
27,850 lb.

Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

- **DESIGNED FOR YOUR JOB**
- **BUILT TO "TAKE IT"**
- **EASY TO OPERATE**
- **EASY TO SERVICE**

IT COSTS LESS TO OWN THE BEST

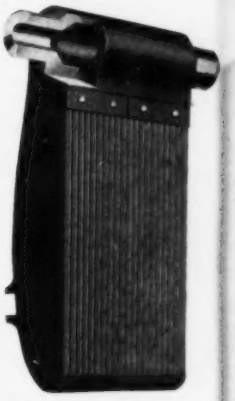
THE KENNEDY HEAVY-DUTY SWING JAW CRUSHER



BUILT TO YOUR SPECIFICATIONS IN ANY SIZE REQUIRED

Built with crusher openings from 7 inches to 66 inches . . . 6,000 to 600,000 lbs.

Frames of Herculite steel with tensile strength up to 60,000 lbs. per square inch.



Reversible Swing Jaws hold wear to an absolute minimum. Hard — Tough — Strong This Has Never Failed

POWER-PACKED, WITH THE STAMINA OF A TANK!

When you start right, you stay right and there is no better known system of economical operation than the use of equipment, designed to perform specific duties.

All KVS equipment is engineered to do the work for which it is designed at utmost efficiency. This means maximum output at minimum cost . . . long life . . . freedom from costly shut-downs for repairs and adjustments . . . ease of operation . . . low power consumption . . . uniform, high grade production.

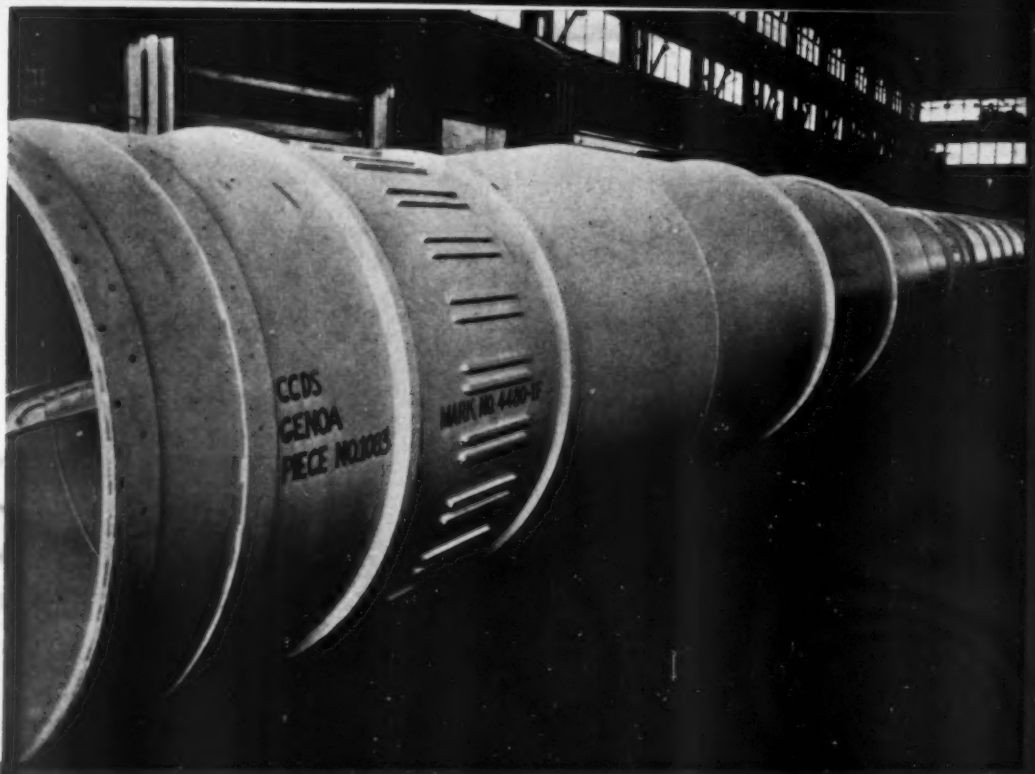
Every claim of superiority for KVS products is based on field surveys and reports from users in every part of the world. It isn't hard to understand why these fine crushers continue to produce peak loads at minimum cost, year-after-year, when you realize that they represent top engineering skill, finest materials and manufacturing facilities without a peer.

Examine the blue prints and engineering specifications of any KVS crusher—they are available on request—and then judge for yourself the BASIC reasons why they deliver the most for the money under all operating conditions. Users say "It Costs Less To Own The Best" and they mean KVS.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE
NEW YORK 16, N. Y.

FACTORY
DANVILLE, PA.



KILNS...BUILT BY KENNEDY
STEP UP PRODUCTION BY 20% OR MORE

Illustrated above is a 230′ kiln being readied for shipment at our Danville, Pa. plant. It is designed to increase production at least 20% over the kiln it replaces.

KENNEDY-built kilns incorporate the very latest proved —and approved — engineering features, including steel plate tires with rollers set on self-aligning bearings. Made in all sizes, to meet specific requirements, KENNEDY kilns have established production and low-cost maintenance records that are unequalled.

Performance records, capacity and output tests show that KENNEDY long kilns not only increase production but last longer and operate at lower cost. Finest quality materials and workmanship and engineering design built into machines that earn larger profits for their users.

One of their outstanding features is the *uniform* quality of all grades of cement produced by KENNEDY rotary kilns. Users say "It Costs Less To Own The Best" . . . that's why they specify KVS!

Send for bulletin describing KVS Kilns, Coolers & Dryers

THINGS YOU SHOULD KNOW ABOUT KVS
Kilns, Coolers, Dryers

Over 50 years of manufacturing "know-how."

Unrivaled manufacturing and shop facilities with engineering skill of the highest calibre.

All metals subject to chemical and physical tests to assure only highest efficiency.

All parts are standard and interchangeable.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION
2 PARK AVENUE · NEW YORK 16, N. Y. · FACTORY: DANVILLE, PA.

BUILT STRONGER TO LAST LONGER WITH THESE EXCLUSIVE KVS FEATURES

★ Synchronous motor built into pulley assembly

★ Frictionless, smooth, quiet operation

★ Power applied only for crushing

★ No gears to waste power

★ Forced Feed lubrication

★ Roller bearings

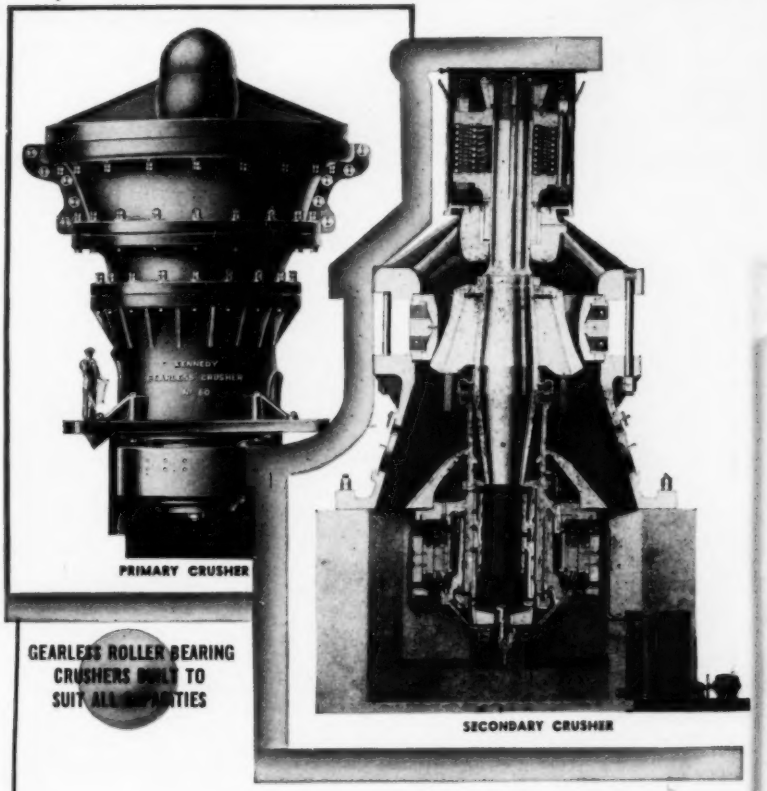
★ Added power at no extra cost

★ Costs less to operate

★ Greater capacity with use of less power in all models

Kennedy Gyratory Crushers

Produce Maximum Tonnage Daily



PRIMARY CRUSHER

SECONDARY CRUSHER

GEARLESS ROLLER BEARING CRUSHERS BUILT TO SUIT ALL CAPACITIES

KVS GYRATORY CRUSHERS are designed to produce maximum tonnage of uniform products, consistently, economically, with a remarkable record of freedom from shut-downs for repairs.

BUILT-IN QUALITY AND FINE WORKMANSHIP is the answer. The engineering principles which make Kennedy crushers the most outstanding in the field, come to life in the use of chemically tested steel and highest quality materials.

EXTREMELY RUGGED CONSTRUCTION cuts operating costs, reduces maintenance to a minimum and delivers more rock tonnage, faster and at lower cost than any other comparable model.

THE KVS OILING SYSTEM HAS BEEN PRONOUNCED virtually "fool-proof." These fine crushers run for years with practically no maintenance. Send for bulletin describing the complete line of KVS crushers. They show why "It Costs Less To Own The Best."

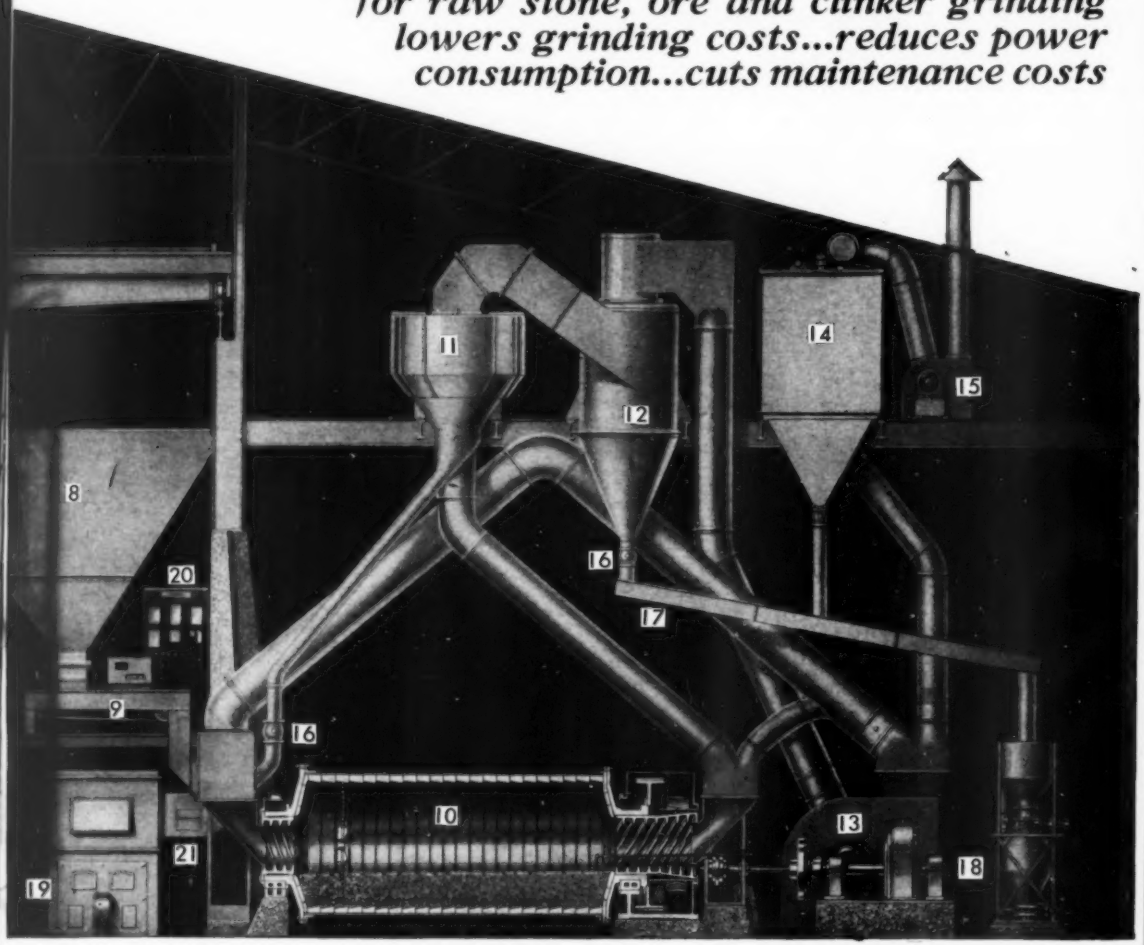
KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE, NEW YORK 16, N. Y. — PLANT: DANVILLE, PA.

KENNEDY STRATIFIED AIR SWEPT TUBE MILL SYSTEM*

(Patents Pending)

for raw stone, ore and clinker grinding lowers grinding costs...reduces power consumption...cuts maintenance costs



8 Mill feed hopper
9 Weighing feeder
10 Stratified Air swept tube mill
11 Radial flow classifier
12 Cyclone collector
13 Mill exhauster
14 Dust filter
15 Dust filter exhauster
16 Rotary air locks
17 Finished material conveyor
18 Automatic pneumatic transport pump
19 Hot air furnace
20 Instrument and control cubicle
21 Automatically controlled tempering air damper

The Kennedy Stratified Air Swept Tube Mill System produces 94% plus through 325 mesh when grinding clinker 2" and finer. It dries and grinds simultaneously and air-cools cement while grinding clinker.

The Kennedy Stratified Mill not only handles raw material, but becomes a *combined dryer and cooler*, thereby serving a three-fold purpose.

Marked economy of operation sets the Kennedy mill apart. By comparison, the savings effected in power consumption, wear-and-tear and man-hours, more than pay the initial installation cost within a ten-year or shorter period. Send for blue-prints and operating data. They show why users say "It Costs Less To Own The Best."

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE, NEW YORK —:— PLANT: DANVILLE, PA.

LONGER ENGINE LIFE

because this lubricating oil also

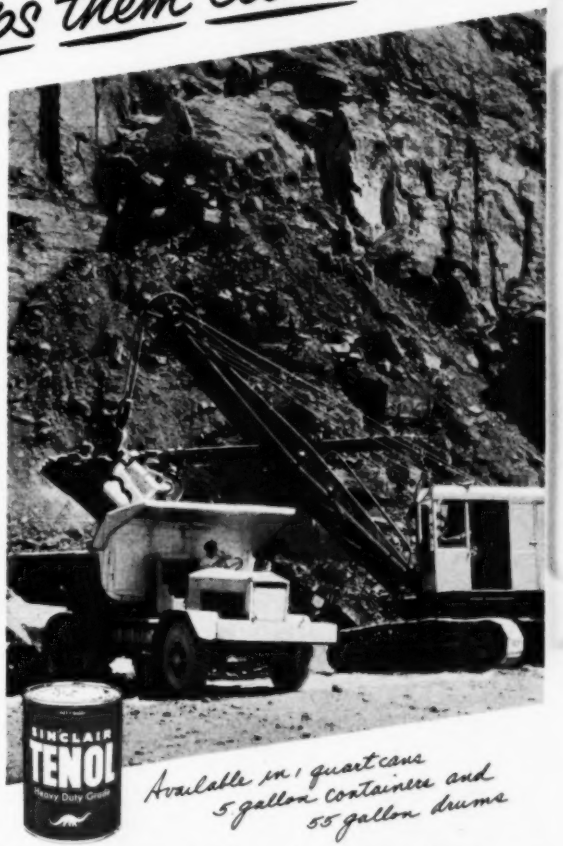
CLEANS ENGINES

—and keeps them clean!

For over 15 years . . . in all types of diesel and gasoline engines in rugged, heavy-duty service . . . Sinclair TENOL® has been doing an outstanding job. TENOL has *proven* it provides long periods of trouble-free operation at sustained high power output, with lowered upkeep costs.

Sinclair TENOL is not to be compared with many alleged "heavy-duty" oils. TENOL is the real thing! You can easily tell if an oil is actually "heavy-duty" . . . See if it is approved under new Military Specification MIL-0-2104. TENOL far surpasses this stringent Government standard!

Save your valuable equipment — phone your nearest Sinclair Representative or write direct to Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.



Available in 1 quart cans 5 gallon containers and 55 gallon drums

SINCLAIR TENOL

prolongs engine life

- No more lacquering of pistons, cylinders, valves.
- TENOL keeps valves and rings from sticking.
- TENOL prevents clogging of oil pump screens and oil channels.
- With TENOL, engines stay clean — free from harmful sludge and carbon.
- TENOL does not thin out at high temperatures, flows freely at low temperatures.
- Low oil consumption with full power, with TENOL.
- TENOL prevents corrosive wear of bearings and other parts.
- TENOL eliminates foaming.

Vol. 44 SEPTEMBER 1951 No. 3

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PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

PIT AND QUARRY

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Investigate "HIGH"

these "LOWS" for a new

in

RAW GRINDING ECONOMY

LOW Power Demand:

Grinding elements of the B&W Type B Pulverizer operate on the low-friction-loss, ball-and-race principle . . . which delivers large outputs with remarkably low power demand.

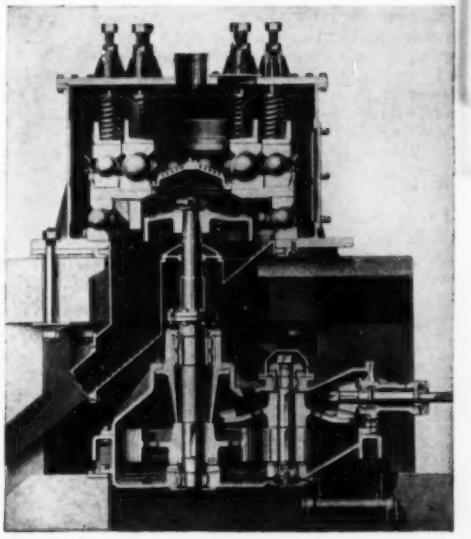
LOW Maintenance:

Wear is uniform and self-equalizing. Grinding elements, of wear-resisting alloys, are selected for long life and low maintenance.

LOW Housing Requirements:

Because of its compactness and high unit output, the Type B Mill permits much higher capacities in the same space . . . replaces other types without additional structure.

B&W is prepared to discuss your rock finishing requirements from first to final grind . . . a complete plant, including all auxiliaries . . . or any part thereof. The Babcock & Wilcox Company; 85 Liberty Street, New York 6, N. Y.



BABCOCK & WILCOX

C-199

editorial

Sell Your Heavy Scrap Now!

THE rapid expansion of steel production made necessary by the current emergency has created an enormous demand for iron and steel scrap which forms a large part of the charges fed to the nation's steel furnaces. At the more than 200 iron and steel producing mills of this country's steel companies, scrap inventories have declined in the last few months from the average of 60 days' supply normally considered a safe working inventory to a backlog that is fluctuating between a few days and a few weeks. This threatens our entire rearmament program. The emergency is so serious that Secretary of Commerce Charles Sawyer has requested federal agents, departments, and bureaus to aid the NPA in its nationwide program by taking measures to uncover government-owned iron and steel scrap and to dispose of these materials through normal channels to scrap dealers.

In 1950 steel production reached a record total of 96,700,000 tons. Steel companies are now operating at an annual rate of over 104,000,000 tons; by the end of 1952 annual capacity is expected to approximate 117,500,000 tons. Iron and steel scrap consumption in 1950 was the highest in history as 29,500,000 gross tons of purchased scrap was used by steel plants and foundries. The estimate for 1951 is 32,500,000 gross tons, and in 1952 requirements may reach 35,500,000 gross tons. There have as yet been no shutdowns of mills as a result of inadequate scrap inventories, but NPA officials say that by next winter steel producers will be seriously "pinched" for scrap, and production goals will be jeopardized unless scrap inventories are fully expanded by collection programs during the balance of this year.

REQUESTS for aid in the program have also been made by NPA to businesses, industries, agriculture, trade associations, local chambers of commerce, auto wreckers, state and municipal authorities, etc. Local chambers of commerce throughout the United States are recruiting Scrap Mobilization Committees, steel plants and foundries have formed a Mobilization Committee for Iron and Steel Scrap, and the Advertising Council has initiated an advertising campaign as a public service for trade paper placement.

This is not a household scrap drive like some conducted during World War II. It is aimed rather at management and administrative officials who are in a position to make policy decisions that will asure quick action in (1) the collection of random heavy scrap, and (2) the writing off of idle, obsolete machinery and equipment.

There are several types of heavy industrial scrap. "Home" scrap is produced within the steel industry itself, resulting from processing steps that turn steel ingots into finished steel products. This amounts to about 25 percent of ingot steel production and is quickly returned to the furnaces. Scrap bought outside the steel industry is called "purchased" or "market" scrap, and it is this type which is not finding its way back to steel mills in sufficient quantities to maintain peak production. To build up adequate supplies of purchased scrap, production scrap from steel consumers (manufacturers) and dormant scrap from everywhere must be brought to scrap dealers.

The urgent need is for heavy industrial grades of scrap as these better grades speed up the charging of furnaces and shorten melting time considerably, thereby increasing output per hour. Dormant heavy scrap is defined as obsolete machinery, tools, dies, jigs, fixtures, and other equipment for which there is no immediate or future use. It also includes items that are broken, worn beyond repair, abandoned, dismantled, or in need of replacement parts that can no longer be obtained. Production scrap is defined as the leftovers derived in the process of manufacturing articles from steel.

THE American Iron and Steel Institute has developed a four-step program for industrial organizations to help them get obsolete equipment and other scrap on its way to the mills. The program is as follows:

1. Go After Dormant Scrap. Start an emergency inspection and inventory of all heavy steel, whether machines, equipment, beams or plates. Sell everything you can possibly spare to your nearest scrap dealer.

2. Keep the Scrap Flowing. Organize a clean-up committee, if you do not already have one. This should be headed by a man from top management who has the authority to scrap obsolete equipment. Continued inspection has been a vital part of all successful scrap recovery programs. Remember that by the end of 1952, the steel industry will be requiring more than 5 million tons more scrap than in 1950. For more steel, there must be more scrap.

3. Make Organized, Permanent Salvage a Top-Management Responsibility. A big burst of enthusiasm may save the steel production rate right now, but the problem will be continuous. In less than two years the steel industry of America will have added more capacity than the entire steel capacity of Great Britain. This big increase will cause a continuous additional demand for scrap. If this country is to enjoy the benefits of additional steel production, the steel industry will need the cooperation of every top executive to see that scrap flows back promptly.

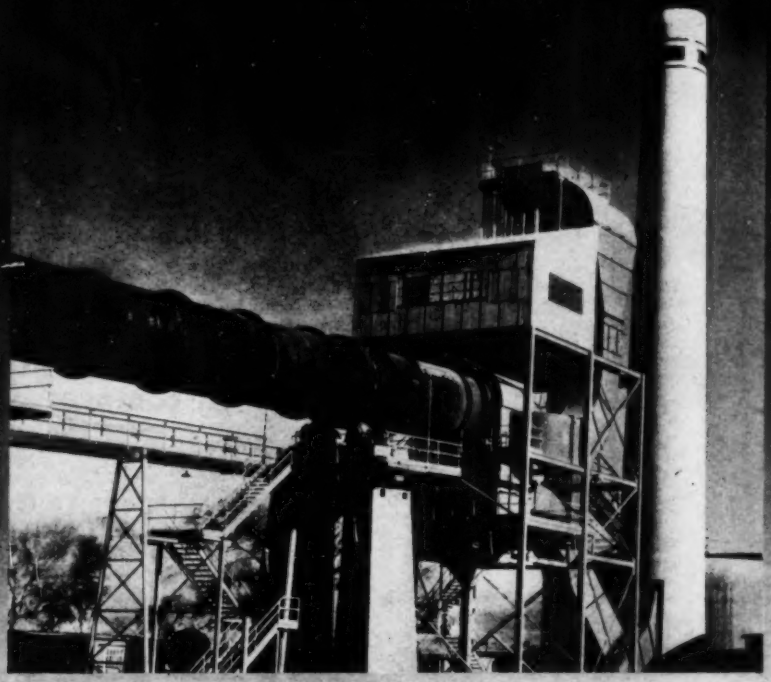
4. Put Scrap Collection on a "Housekeeping" Basis. Besides increasing the steel supply, continuous scrap recovery of obsolete machines and equipment reduces taxes through inventory write-off, improves safety conditions, gives lowered insurance rates, and clears valuable space.

The nonmetallic minerals industries are important users of machinery and other forms of heavy steel, and they wear out equipment more rapidly than most other industries. They need new machinery desperately to keep their plants operating at the peak levels now existing and in prospect. They can insure getting at least a part of the needed new machinery and can also contribute to the defense effort by selling all their heavy scrap now.

Walter E. Trauffer

SMIDTH

ROTARY KILNS



Over 950 Smidth Rotary Kilns have been supplied, some over 500 feet long. The total capacity corresponds to one-half the World's production of cement.

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London, W. 1, England

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KEEP AIR COMPRESSORS ON THE JOB—

regardless of operating conditions . . . with TEXACO air compressor oil

What's the best air compressor oil to keep your compressors working and your maintenance costs low? That depends on your operating conditions. But it *must* be an oil especially designed to meet those conditions. Texaco has it. For example—

** To assure clean operation and reduce wear under *normal conditions*, use a Texaco *straight mineral* air compressor oil.

** To *overcome rust* conditions in compressors, inter- and after-coolers, lines and receivers, use a Texaco *rust-inhibited* air compressor oil.

** To *avoid carbon and gum* formations, use a Texaco heavy-duty air compressor oil, with special detergent and oxidation-resistant properties.

** To *eliminate excessive wear* caused when moisture condensation in cylinders washes away lubricant, use a Texaco *compounded* air compressor oil.

A Texaco Lubrication Engineer will gladly help you select the one proper Texaco air compressor oil to assure you greater efficiency and lower costs under your particular operating conditions. And don't forget to ask him about the Texaco Simplified Lubrication Plan for *all* your equipment. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 E. 42 St., New York 17, N. Y.

DRILLS of all types run better with *Texaco Rock Drill Lubricant EP*. One user states: "We are amazed at the performance of this oil in comparison with what we had been using. We have cut oil consumption 50% and have shown a remarkable reduction in maintenance on all our drills."

TEXACO

TEXACO Lubricants and Fuels

news of the industry

PIT AND QUARRY

Chamber of Commerce Issues Book on Sabotage And How to Prevent It

Necessary steps to be taken by industry and defense officials for combating sabotage are set forth by civilian and military experts in a new publication of the Chamber of Commerce of the United States. The 25-page booklet, titled *Sabotage and Plant Protection*, contains addresses on the subject from a special session of its recent annual meeting.

Frank V. Martinek, assistant vice-president of Standard Oil Company of Indiana, Chicago, lists these steps in setting up an effective industrial defense system:

> The management of the Mississippi Lime Company of Missouri recently disclosed that there has been evidence of sabotage in the big Ste. Genevieve (Mo.) plant. A $1,000 reward was offered for the apprehension of persons responsible for the sabotage. Because this company is manufacturing a product highly essential to the national military and defense effort, the charge of sabotage assumes serious significance.
>
> It was reported that large pieces of iron had been thrown into crushers to choke or break them down.

1. Alerting top management of every American industrial plant of the current danger.
2. Taking immediate steps to organize defense procedures.
3. Forming a top executive committee on sabotage, espionage, and subversive activities in every plant.
4. Establishing a plant control center to serve as a clearing house for gathering, classifying, collating, and evaluating information from all possible sources.
5. Organizing and training volunteer groups in rescue, first aid, radiological monitoring, and other activities.

Included in the booklet are comments of Melvin H. Baker and Richard L. Davies. Mr. Baker, president of the National Gypsum Co., Buffalo, and a National Chamber director, presided at the meeting. Mr. Davies, president of the Pennsalt International Corporation, Philadelphia, served as moderator.

Also contained in the Chamber of Commerce publication is a summary of floor discussion on protection of classified information; principles of plant protection; handling of saboteurs; disloyal employees; training facilities; Russia's atomic bomb; employee screening and fingerprinting; and where plant protection responsibility lies.

Coming Events

October 8-12, 1951 — Chicago. 39th National Safety Congress and Exposition. Stevens, Palmer House, Congress, Morrison, and LaSalle Hotels.

October 17-19, 1951—White Sulphur Springs, W. Va. Fall meeting. National Industrial Sand Association. The Greenbrier.

November 14 and 15, 1951—Chicago. Annual meeting, National Slag Association. Hotel Knickerbocker.

November 26-27, 1951—Chicago. Convention of National Association of Silo Manufacturers. Palmer House.

January 15-17, 1952—Washington. Seventh annual convention, National Agricultural Limestone Association. Hotel Statler.

February 11, 1952 (week of)—Chicago. 36th annual convention and exhibit, National Sand and Gravel Association. The Stevens Hotel.

February 11, 1952 (week of)—Chicago. 22nd annual convention and exhibit, National Ready Mixed Concrete Association. The Stevens Hotel.

$2,500,000 Gypsum Plant Planned by Kaiser Division To Serve Pacific Northwest

Kaiser Gypsum, division of Henry J. Kaiser Company, recently purchased nine acres on tidewater in the Duwamish district of Seattle as the site of a proposed plant that would be the first complete gypsum products factory in the Washington-Oregon-Idaho area.

The facilities, now in the planning and engineering phase, would serve civilian and defense construction in the Northwest, as well as Alaska, Hawaii, and other Pacific bases.

The property, fronting on East Marginal Way near the end of 1st Avenue South and extending to the Duwamish waterway, was acquired for approximately $100,000. An additional expenditure of $25,000 is planned for filling, grading, and improving the land prior to construction.

A nationally-known firm of consultants employed by the company has recommended that to serve the area most efficiently Kaiser Gypsum construct a three-kettle calcining plant and a gypsum board plant capable of producing 100,000,000 square feet per year. Estimated cost of a plant of this size is approximately $2,500,000.

The plant would end the comparative isolation of this area of the Northwest from sources of supply. The nearest existing gypsum products plants are in Montana, Utah, Nevada, and California—located at an average shipping radius of nearly 1,000 miles from Seattle. The proposed plant would produce a full line of gypsum products to serve all Northwest cities.

Kaiser Gypsum is now operating two manufacturing plants in California at Long Beach and Redwood City. These are supplied with raw gypsum from one of the world's largest gypsum deposits on San Marcos Island, Lower California, Mexico, which is operated by the company's wholly-owned subsidiary, Compania Occidental Mexicana, S. A. The San Marcos deposit is one of only two on the entire North American continent situated on tidewater with the advantage of low-cost sea transport. The Company operates its own bulk ore vessel, a 10,000-ton Liberty ship especially equipped to handle this type of raw material.

Indian Cement Concern Opens Fifteenth Plant—Output, 200,000 Bbl. Yearly

According to *Engineering News-Record*, the Associated Cement Companies recently opened a new plant at Sevalia in the state of Bombay. It was the fifteenth plant of this organization. Location of the facilities at Sevalia was said to have been due to the proximity of limestone and bauxite. Equipment and construction materials were almost entirely of Indian origin.

Initial production of the new plant will be 100,000 tons per year, which will be increased gradually to 200,000 tons, the rated capacity. India is now reportedly nearly self sufficient in cement production and will soon seek export markets in other Asian countries. Total cement production of India is expected to be 2,200,000 tons this year and 2,750,000 tons in 1952.

Of all building materials in India, cement had the lowest price increase in 1950—only 83 percent. Iron and steel went up 163 percent; brick, 233 percent; stone-metal, 284 percent; and sand, 335 percent.

Ceiling Price Filing Date Extended Indefinitely by OPS

According to a recent report, the Office of Price Stabilization states that Form No. 8 for filing new ceiling prices has been indefinitely suspended.

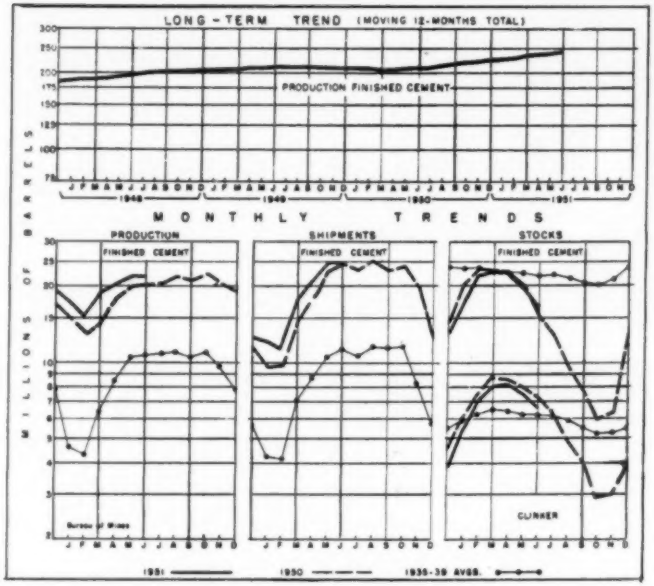
Producers are instructed as follows: if they filed Form No. 8 on June 14 or before, they are to continue to operate under the new prices; if they filed Form No. 8 after that date, they are to continue to operate under the General Ceiling Price Regulations.

It was stated that Form No. 8 had been suspended "so that provisions of the new Capehart Amendment may be taken into consideration in filing new ceiling prices." Local newspapers will report later developments.

Microfilms of Pit and Quarry Now Available for 1949-51

As announced in the pages of PIT AND QUARRY in July, 1950, we entered at that time into an agreement with University Microfilms of Ann Arbor, Mich., to reproduce in microfilm form issues of PIT AND QUARRY and the CONCRETE MANUFACTURER on the basis of an entire volume in a single roll in editions of 30 or more.

Now the first two of the "installments"



SUMMARY—The output of 21,984,000 barrels of finished portland cement in June, 1951, as reported to the U. S. Bureau of Mines, was 10 percent greater than that reported for June, 1950. Mill shipments of 24,935,000 barrels represented an increase of 1 percent over the same month of 1950, while stocks of 16,439,000 barrels were 7 percent greater than at the same time last year. Clinker production during June was 10 percent greater than in June, 1950, and amounted to 21,327,000 barrels.

PRODUCTION—153 plants located in 36 states and Puerto Rico, and including a new plant in Virginia, reported production during the month. This compares with 150 plants which in June, 1950, manufactured 20,001,000 barrels of finished cement. As indicated above, clinker production was 10 percent greater than in June, 1950.

SHIPMENTS—Mill shipments of finished cement were 1 percent greater than those of June, 1950. Shipments were greater in 12 districts and lower in 7 districts than shipments recorded in June, 1950. Percentage changes range from an increase of 63 percent in Puerto Rico to a decrease of 18 percent in Kansas. Except for the eastern Pennsylvania-Maryland district, major producing areas reported shipments fairly close to last year's figures.

STOCKS—Mill stocks of 16,439,000 barrels of finished cement were reported for June, 1951—7 percent higher than stocks of the same date last year, while clinker stocks amounted to 6,618,000 barrels—10 percent less than at the same time in 1950.

—1949-50 (Volume 42) and 1950-51 (Volume 43)—are available. Volume 42 sells for $7.10, plus postage, and Volume 43 for $7.45, plus postage. These prices are approximately equal to the cost of binding the same material in a conventional library binding.

WE'RE MOVING!

On September 20 Pit and Quarry headquarters will be moved to The Manhattan Building, 431 South Dearborn Street, Chicago 5. The new offices will provide better and more spacious facilities for our steadily expanding activities in serving the vast nonmetallic minerals industries, and it is hoped that many of our readers will avail themselves of our cordial invitation to drop in for a visit.

Plans for N.S.G.A.-N.R.M.C.A. 1952 Meetings Progressing

Plans are going forward satisfactorily for the 36th annual convention of the National Sand and Gravel Association and the 22nd convention of the National Ready Mixed Concrete Association, to be held at the Stevens Hotel, Chicago, during the week of February 11, 1952.

The exhibit committee will meet in Washington on October 5 to allocate space on the basis of applications received up to this time. However, applications for space will be accepted up to the day of the convention, or until all space has been assigned.

According to Vincent P. Ahearn, executive secretary of the two associations, the 1952 show is expected to be a record-breaker. Members have received folders explaining arrangements and facilities available for the exhibit; and associate members have been informed of the importance of this show to their businesses.

The exhibit is designed particularly to appeal to the superintendents and operating men of the sand-and-gravel and ready-mixed concrete industries. It will demonstrate to the younger men of the two industries what the future holds for the production, distribution, and use of sand and gravel and ready-mixed concrete. Members are urged to send representatives of their operating staffs and also men new in their organizations to this meeting.

After considerable discussion among those in charge of arranging for the National Slag Association's annual meeting, it was decided to leave the schedule unchanged. The sessions of N.S.A. will be held, as originally planned on November 14 and 15 at the Hotel Knickerbocker.

Near Record Consumption Of Industrial Explosives Reported During 1950

Consumption of 719,841,325 lb. of industrial explosives in the United States during 1950 was 14 percent greater than in 1949 and was the second highest annual total in history, according to the U. S. Bureau of Mines. This near-record poundage was only slightly lower than the record consumption in 1948, when 725,227,173 lb. were used.

Consumption of all types of explosives except liquid oxygen explosives increased in 1950, as compared with 1949. Sales of high explosives other than permissibles advanced to a new record annual total, and sales of permissible explosives were higher than in any other year except 1947 and 1948. Consumption of high explosives other than permissible gained 14 percent over 1949 owing to gains in all consuming classifications except "all other purposes". In coal mining the gain in 1950 was 24 percent; in metal mining, 15 percent; in quarrying and nonmetal mining, 16 percent; and in railway and other construction work, 7 percent over the consumption in 1949.

Total sales of permissible explosives, of which nearly all is used in coal mining, increased 19 percent over 1949. Consumption of black blasting powder was 3 percent greater than in 1949 due to increased sales for all consuming uses except metal mining and "all other purposes". Use of liquid oxygen explosives in coal mining was slightly lower than in 1949, and this decline was not entirely compensated for by sharply increased consumption in quarries and nonmetal mines.

Quarries and nonmetal mines used 141,249,390 lb. of all types of explosives in 1950, or 16 percent over the 1949 consumption. All states using large quantities of explosives for quarrying and nonmetal mining showed increased consumption, with the exception of New York, which showed a very slight reduction. Most of the explosives used in quarries and nonmetal mines was of the high-explosives other than permissible type, but some black blasting powder and permissibles also were used.

The largest explosives-consuming states in 1950 were also the large coal producers. Pennsylvania with its large coal-mining and quarrying industries consumed 18 percent of the total, followed by West Virginia with 8 percent, Kentucky with 6 percent and Ohio with 5 percent. The next ranking states were Illinois, Indiana, Minnesota, Texas, and Arizona.

Giant Portland Cement Co. Plans $4,500,000 Expansion

In a notice to stockholders of the Giant Portland Cement Company, the management explained that approval of a $4,500,000 loan had been received from the Reconstruction Finance Corporation for expansions at the firm's Harleyville, S. C., plant. According to present plans, the officials announced, capacity would be expanded by about 1,000,000 bbl. a year to satisfy the needs of the Atomic Energy Commission's plant 70 miles away. This would more than double the current production rate.

Stockholders' authorization of a mortgage of the firm's facilities at Egypt, Pa., and those at Harleyville (Carolina Giant Portland Cement) to secure the loan was sought by company officials.

Broward Quarries Purchased By Maule Industries, Inc.

According to a press announcement appearing in the *Wall Street Journal*, Maule Industries, Inc., of Miami, Fla., has purchased the Broward Quarries near Fort Lauderdale from the Tri-State Asphalt Company, Martins Ferry, W. Va.

Maule will add new equipment at the Broward quarries for the production of concrete blocks and ready-mixed concrete.

Magnet Cove Barium Company To Build Bentonite Plant

Construction of a bentonite processing plant north of Greybull, Wyo., has been started by the Magnet Cove Barium Company. According to Lee Grenier, Greybull area manager for the firm, the plant will be in operation this fall.

The bentonite will be taken from an area east of the plant, across the Big Horn River. It will be carried across by a tramway and unloaded at the plant. Work has been started on the tramway and a railway spur to the plant. O. W. Van Dyke of Houston, Tex., vice-president of Magnet Cove, went to Greybull to assist with preliminary work on the facilities.

Cover Picture....

• In a setting of scenic splendor at Buchanan, Va., the Liberty Limestone Corporation plant featured on our cover this month is currently turning out agricultural limestone, rock dust, fillers, feed lime, and crushed stone at the rate of 2,500 tons per day—1,500 tons of ground and 1,000 tons of crushed stone. Recently completed enlargement of facilities have made this possible. A new 73-in. Raymond roller mill which has increased production of ground products by 55 percent supplements four 54-in. Raymond mills and three rod mills. At Rocky Point, 8 miles east of Buchanan, and also on the James River, Liberty operates another plant for the production of high-calcium limestone products. One Raymond mill at this installation has a capacity of 200 tons per day, and total production is about 1,000 tons of crushed and flux stone daily.

Jan.-July Building Total In '51 Tops $10,000,000,000 But July Figure Declines

Construction contracts awarded in the 37 states east of the Rockies for the first seven months of 1951 set a new high for that period, with a total of $10,187,939,000, according to F. W. Dodge Corporation officials. This was 23 percent greater than 1950's total, up to this year the highest seven months on record. The 1950 figure was more than $8,000,000,000.

Meanwhile, total construction awards slackened a bit in July, as compared with June. The July total of $1,379,830,000 was down 2 percent from the previous month, and down 3 percent from the July, 1950, figure.

For the month of July, non-residential awards at $536,533,000 were 3 percent lower than in June, but 10 percent higher than in July of last year. Residential contracts at $548,144,000 were up 1 percent over June, but down 19 percent from July, 1950. Public and private works and utilities at $295,153,000 were 5 percent below June, but 14 percent above July, 1950.

Comparing the seven months of this year with last, non-residential contracts were $4,603,178,000 or 65 percent greater; residential awards at $3,871,871,000 were down 2 percent; public and private works and utilities at $1,712,890,000 were up 10% over 1950.

Florida Portland Cement Div. To Add 1,300,000 Bbl. Yearly

According to an announcement issued recently by the Florida Portland Cement Division of the General Portland Cement Company, the firm has initiated a program aimed at increasing the annual production capacity of its Tampa, Fla., plant by 1,300,000 bbl.

A certificate of necessity has been granted by the Defense Production Authority, and work has begun on installing the new cement-making machinery and equipment. The plant enlargement is expected to be completed early in 1952.

International Minerals Buys Speiden, Innis & Co. Plant

According to a recent issue of the *Internationalite*, house organ of the International Minerals & Chemical Corporation, that firm recently acquired all plants, properties, and other assets of Innis, Speiden & Company of Niagara Falls, N. Y., one of the oldest potash chemical companies in America, in a deal involving approximately $2,500,000.

Reorganization incident to the transaction dissolved Innis, Speiden & Co. A new corporation was formed, to be known as Innis, Speiden & Co., Inc., a wholly-owned subsidiary of International. All assets of the original firm, with the exception of the Niagara Falls, N. Y., plant, were transferred to the new corporation. The Niagara Falls facilities were transferred into the Potash Division of International and will be known as the Niagara Falls plant of this firm.

H. A. Huschke Joins OPS On Leave of Absence From A.L.I. Managership

Effective July 25, 1951, Henry A. Huschke, managing director of the Agricultural Limestone Institute, left his duties with the A.L.I. to take an indefinite leave of absence. He has accepted the post of head of the Agricultural Chemicals Section of the Office of Price

Henry A. Huschke

Stabilization. (Prior to his association with A.L.I. Mr. Huschke worked with the Agricultural Chemicals Section of OPA during World War II.)

In his new position Mr. Huschke will work on a pricing regulation "tailored" to fit the needs of the agricultural liming materials industry. He will also deal with pricing problems affecting other agricultural industries.

Throughout his six years as managing director of A.L.I. Mr. Huschke rendered particularly valuable service in creating unusual and effective promotional material and in working with the legislative and administrative branches of the federal government.

Engineers' Spanish Dictionary Offers Popular Features

The second edition of the *Engineers' Dictionary*, Spanish-English and English-Spanish, compiled by Louis A. Robb, vice-president, Ambursen Engineering Corporation, is now available in flexible binding.

The 664-page volume is said to be full of Spanish equivalents which cannot be found elsewhere. Based upon the compiler's 30 years of experience with and in Latin America, this dictionary lists 75,000 terms commonly used by engineers; nontechnical expressions are included.

Cited as features are the following: engineering phrases which cannot be rendered on a word-by-word basis are given special attention; the two-way feature offers help in translating journals, orders, and general correspondence; in addition to the usual term for a given article or process, the dictionary supplies the local term used in each country; names of tools and items of equipment are given.

This edition not only contains many more words and phrases, but also gives expressions needed in electrical, civil, and mechanical engineering, radio, and television. Special vocabularies of many industries and professions are covered. The gender of all Spanish nouns used is indicated.

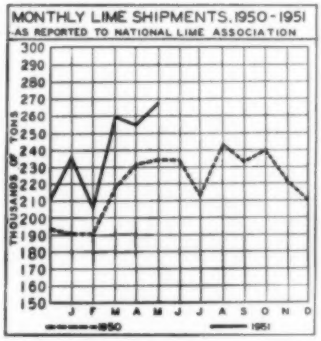
Engineers' Dictionary is published by John Wiley & Sons, Inc., New York, N. Y. Price: $12.50 per copy.

Filtrol Corporation Announces Dust Collection Program

At the Filtrol Corporation's plant in Los Angeles an extensive air purification and dust collection program is nearing completion, with the installation of a 25,000-cu. ft. Western Precipitation Corporation wet Cottrell precipitator under way. Filtrol produces natural clay catalysts and decolorizers for oil refineries.

The new precipitator, according to G. E. Kidde, manager of manufacturing, and C. D. McMartin, superintendent, is designed as an addition to the plant's product drying system and is intended to recover all products in the exhaust gas stream which would otherwise pass through to the atmosphere.

Operating on the electrostatic principle, the precipitator is designed to charge all entering particles with high-voltage electricity, collect them on an electrode, and subsequently wash them away in solution.



According to data collected by the National Lime Association, 45 companies in May, 1951, shipped 268,652 tons of lime (167,657 quicklime; 100,995 hydrate). Reporting companies represent 58.7 percent of the association members' total capacity of record. Based on Pit and Quarry's estimate for the remainder of the industry, the total shipments were approximately 503,400 tons. Shipments by uses and grade for May, 1951, were:

	Quicklime	Hydrate
Agricultural	4,343	19,128
Building	18,182	50,731
Chemical	145,132	31,136
Totals	167,657	100,995

Hawaiian Cement Co. Gets $4,000,000 RFC Loan For Plant Reconstruction

According to an announcement appearing in the *Honolulu Advertiser*, the Defense Production Administration has approved an RFC loan of $4,308,303 for the reconstruction and development of the Hawaiian Cement Company's plant in the Waianae area. It is expected to be a $4,000,000-a-year operation, by a conservative estimate. Hawaii users of cement now spend about $2,600,000 a year for cement shipped from the United States.

During World War I cement was made at Paia, Maui, from silica-bearing trachyte and beach sand. The plant was brought to Cahu in World War II and established in the Waianae district, where Harold Sterns, former U. S. geologist, had found large deposits of trachyte.

Allan Renton and associates have acquired a limestone deposit in the area which geologists of the Intercontinental Engineering Corporation state will supply the Hawaiian Cement Company for 40 years. Other deposits are said to be available elsewhere in this vicinity. According to local authorities, the supply of trachyte is unlimited. This material has the added advantage of being clay-bearing.

S K F's $10,000,000 Program For Plant Expansion Under Way

Construction is under way in the $10,000,000 program of plant expansion, and equipment and machinery replacement launched by S K F Industries, Inc. One of the nation's major producers of ball and roller bearings, S K F is adding to its Philadelphia plant No. 1, a laboratory unit, a new building to house finished stores, and a bridge connecting the main factory building with the new addition.

At the Philadelphia Plant No. 2 new and larger heat-treating facilities, and increased manufacturing capacities for spherical and cylindrical bearings will be provided.

At Shippensburg, Pa., a plant addition will step up the production of retainers.

Israel Needs Lime Plants, Equipment, and Foreign Aid

Eight new lime plants are needed in Israel according to an economic survey prepared by the Israel Government Investment Center. Present production is about 80,000 tons annually. The demand is expected to reach 165,000 tons per year by 1953.

The Israel Government would like to interest outside capital in supplying investment money for the purchase of machinery and other items that must be purchased outside of the country with hard currency.

Texas Construction Material Company, which operates sand and gravel plants at several Texas locations, has moved the headquarters from 2905 Milam Street to new and larger quarters at 1919 Travis Street, Houston.

William C. Johnson, Allis-Chalmers Executive, Dies of Heart Seizure

William C. Johnson, executive vice-president of Allis-Chalmers Manufacturing Company, died unexpectedly July 26. He was a member of the firm's board of directors and also a member of the executive committee of the board. In addition, he served as chairman of the board of Canadian Allis-Chalmers (1951) Ltd. He was 49 years of age.

Mr. Johnson was born in Birmingham, Ala., and was educated in that city. He began his career in the electrical industry in 1920 as an apprentice for the Alabama Power Company. It was here that he first became acquainted with the electrical products produced by Allis-Chalmers, being particularly impressed by one of the firm's hydro-electric installations.

In 1924 he became associated with Allis-Chalmers as a machinist helper, and during the next five years he worked with the company's field service and erection department.

In 1929 he was named representative of the Allis-Chalmers crushing and cement division in the Atlanta, Ga., district, which covered seven states, and six years later he became the company's general sales representative at Chattanooga, Tenn.

In 1937 Mr. Johnson was selected to open the company's district sales office in Knoxville, Tenn. It was at this time that he was called upon to conduct special foreign sales negotiations.

Returning to Milwaukee in 1940, he was named sales manager of the firm's crushing and cement department. Two years later he was made general sales manager of general machinery products for Allis-Chalmers, in this post replacing the late Walter Geist, who had been elevated to the presidency of the company.

In 1944 Mr. Johnson was made vice-president of the general machinery division, where he served until his appointment as executive vice-president in charge of that division in June, 1947. He was named a member of the firm's board of directors in January, 1948, and in March of the same year was appointed a member of the firm's executive committee. Following the death of president Walter Geist in February, 1951, he was appointed executive vice-president in charge of both general machinery and tractor divisions.

William C. Johnson

In 1946, the board of directors approved the Johnson long-range sales plan to increase the general machinery field selling efforts, increase the division's capacity for engineering and product development, and provide manufacturing facilities necessary for the higher level of sales.

National Gypsum Co. to Build Addition to Buffalo Office

The National Gypsum Company will build a $552,230 addition to its office building at 325 Delaware Ave., Buffalo, N. Y. The addition, in the rear of the present structure, will be three stories high and equipped with a bomb shelter. This is believed to be the first facility of its type in a new office structure in Buffalo.

National Gypsum has received permission from the National Production Authority to proceed with the expansion.

Repair Before Failure Found Best Practice For Long Truck Service

High operating expense and heavy loss of capital investment in delivery and other motor vehicles can be prevented by a regular truck maintenance program. This was brought out in a forum discussion at the mid-year meeting of the National-American Wholesale Grocers Association. The subject of savings in trucking and delivery operations was presented by W. L. Vande Water, GMC truck merchandising manager; R. T. Jennings, GMC field training director; and J. W. Millard, Kudner Agency. The discussion was based on a GMC-Kudner survey of several truck fleets belonging to association members. Many of the points brought out are of interest also to nonmetallic minerals producers.

Mr. Jennings stressed the fact that the modern commercial vehicle is designed and built to render hundreds of thousands of miles of dependable service, provided that a well-planned maintenance program is followed. He stated that adoption of a "repair before failure" policy not only avoids costly, disruptive road delays but also saves hundreds of dollars of maintenance expense by salvaging related parts that would be ruined by complete failure.

Mr. Jennings reported that when a complete inspection was made on every vehicle in one wholesale grocer's fleet, the results pinpointed irregular maintenance patterns that were causing unusually high repair bills. He emphasized that records must be kept on individual trucks to disclose their inefficiences, and suggested that each should have regular attention to be kept in first-class condition.

In concluding the forum, Mr. Vande Water said that the survey had definitely pointed the way to the savings anticipated. He revealed that the GMC Truck and Coach Division was instructing its field force and dealers in the survey method through traveling schools, and would be able to make additional transportation surveys in the near future.

• This aerial view, taken May 24, 1951, shows the enlarged production facilities, including the new 475-ft. kiln, which went into operation early in June at the Des Moines, Ia., plant of Marquette Cement Manufacturing Company. With this project now completed and Marquette's new plant at Brandon, Miss., scheduled to be in production by late summer, the company expects to have over 1,000,000 bbl. more cement available to its customers this year than was the case last year.

49th Natl. Safety Congress Schedules Many-Faceted Program, Exhibit, Oct. 8-12

The 39th National Safety Congress and Exposition of the National Safety Council will be held in Chicago, Ill., October 8-12. This Congress has scheduled more than 139 meetings, luncheons, and discussions, according to the preliminary program just released.

In addition to the meetings there will be an exposition of accident prevention equipment in which more than 140 exhibitors will participate. So many exhibits are scheduled that both the Casino Room of the Congress Hotel and the Exhibition Hall of the Stevens Hotel will be occupied.

The Safety Congress will hold meetings in five of the city's leading hotels—the Stevens, Congress, LaSalle, Palmer House, and Morrison.

There will be many meetings of particular or general interest to producers of nonmetallic minerals, including the opening annual Council meeting on Monday morning. At this meeting the general business of the organization will be transacted, and there will be addresses of general interest. The annual banquet on Wednesday evening will feature music, entertainment, and a widely known speaker.

Special section meetings of the Cement and Quarry Section, the Mining Section, the Industrial Hygiene conference and others have listed subjects with wide appeal to nonmetallic minerals producers.

A session on *Associations and Their Safety Programs* will be held on Wednesday morning. H. F. Reinhard, manager, Safety Codes Department, Union Carbide and Carbon Corporation, will preside. Speakers will include Ned H. Dearborn, president, National Safety Council, and Ivan F. LeGore, manager, accident prevention bureau, Portland Cement Association.

Dust, heat, and dermatitis (skin diseases) will be subjects highlighted on the Industrial Hygiene meeting on Thursday morning which will be presided over by William R. Bradley, chief industrial hygienist, American Cyanamid Company, and William P. Yant, director of research and development, Mine Safety Appliances. Speakers will include experts from the American Brake Shoe Company, Owens-Illinois Glass Company, and Allis-Chalmers Manufacturing Company.

Maintaining Interest in Accident Prevention is the subject of a general morning session on Thursday. M. F. Biancardi, manager, health and safety department, Allis-Chalmers Manufacturing Company, will preside. Speakers will discuss techniques in keeping interest alive among management and employees.

The Mining Section will hold sessions during the first four days. Most of the discussions will concern metal mines primarily but one on Monday afternoon will be of particular interest to all quarry operators. This is a talk on *Activities of the Mechanical Mining Team with Relation to Safety, Ore Mines and Quarries* by Ralph McEniry, captain of mechanical mining team, Tennessee Coal, Iron, and Railroad Company.

The preliminary program of the Cement and Quarry Section follows:

Wednesday, October 10, Stevens Hotel
Third Floor, West Ballroom

2:00 p.m. Annual Report, General Chairman — Lea P. Warner Jr., personnel and safety manager, Warner Company, Philadelphia, Pa.

2:15 p.m. *What's New in Explosives' Safe Practices*—F. D. Bickel, explosives department, E. I. du Pont de Nemours and Company, Wilmington, Del.

2:45 p.m. Discussion.

3:00 p.m. *Controlling Severest Hazards* —O. A. Lawrence, plant manager, Universal Atlas Cement Company, Buffington, Ind., and Howard Reifenstahl, safety director, Alpha Portland Cement Company, Easton, Pa.

3:45 p.m. Discussion.

Thursday, October 11, Stevens Hotel
Third Floor, West Ballroom

2:00 p.m. Election of officers, 1951-52. Lea P. Warner Jr., presiding.

2:15 p.m. *Safety Problems of Today and Tomorrow* (a symposium). Discussion Leader — Lea P. Warner Jr.
(a) On the Job Safety — R. W. Cox, treasurer and general auditor, Ash Grove Lime and Portland Cement Company, Kansas City, Mo.
(b) Off the Job Safety — A. H. Zeilinger, superintendent of Safety, The Colorado Fuel and Iron Corporation, Pueblo, Colo.

3:00 p.m. *Safety Training* (speaker to be announced).

3:30 p.m. Discussion.

Mexican Gulf Sulphur Co. Plans $1,875,000 Facilities

Eugene L. Norton, president of the Mexican Gulf Sulphur Company, has announced that the firm has arranged for financing a new sulphur plant, to be erected at San Cristobal, Mexico, and that plans for the new facilities are rapidly taking shape.

Gilbert B. Ebarb Sr., formerly associated with the Jefferson Lake Sulphur Company, has been elected a vice-president of Mexican Gulf. He is in charge of design and specifications.

Mr. Morton stated that the firm had obtained a loan of $1,875,000 from the Export-Import Bank, a sum which is believed sufficient to provide for construction costs, plus the additional required working capital.

Mr. Norton also announced that the principal asset of the subsidiary, the Pan American Exploration Company, now being dissolved, has been sold. To date Mexican Gulf has received $176,000 in cash, and retains an interest in possible future oil payments. In the event that sulphur is discovered on tideland properties, sulphur rights must first be offered to the Mexican Gulf Sulphur Co.

Potash Output, Sales Rise—Value "Highest Ever" In United States in 1950

The long-term upward trends in the production and sales of domestic marketable potassium salts, which had been in evidence from 1934 to 1948, and which had been interrupted in 1949 by the New Mexico strike, were resumed in 1950. According to reports by producers to the U. S. Bureau of Mines, the total domestic output of potassium salts in that year reached a record high of 2,241,044 short tons, with an equivalent K_2O content of 1,286,762 tons. Sales in 1950 were 2,220,803 tons, with an equivalent K_2O content of 1,275,494 tons; both were records. The value of the sales also reached a new high—$39,695,038. Stocks in producers' hands at the end of 1950 were larger than in recent years. Exports declined in both quantity and value in 1950 from 1949, but imports increased greatly in both categories. Apparent domestic consumption of potash (K_2O) in 1950 increased 339,629 tons from the 1949 figure.

Production of 60-62 percent K_2O minimum grade of the muriate of potash increased markedly in 1950 over 1949, rising to a record high, but there was a notable decrease in the output of lower-grade muriate. The production of manure salts dropped very sharply—from 177,315 tons in 1949 to only 21,532 tons in 1950. The combined output of sulphate of potash and sulphate of potash-magnesia reversed its recent trend and rose in 1950 to a new high of 223,109 tons.

The Western states remain dominant in domestic production of potash. California, New Mexico, and Utah furnished virtually all of the 1950 output, the largest part coming from the deeply buried Permian sylvite and langbeinite deposits in the Carlsbad region of southeastern New Mexico. The eastern United States supplied only a small quantity—from Maryland and Michigan.

The strike called on November 19, 1949, by the CIO Mine, Mill, and Smelter Workers' Union Local 415 at the three potash-producing plants of the Carlsbad region, New Mexico, ended January 31, 1950, after an interval of 73 days.

Acheson, OPS Branch Head, Named to R.M.C. Committee

Walter H. Acheson, new chief of the Building Materials Branch of the Office of Price Stabilization, has been named chairman of the newly-appointed Advisory Committee on Ready Mixed Concrete.

Mr. Acheson was formerly head of the Masonry Materials Division. In his new post he will be responsible for many important industries, including sand and gravel, crushed stone, slag, construction, cement, lime, gypsum, flat glass and glass containers, structural clay products, and related fields.

Riddle Quarries, Marion, Kan., has completed a new crushing plant between Little River and Windom, Kan. This is the second plant for the company.

Kansas Flood Damage, Rated at $1,000,000,000, Cripples Many Plants

The recent record-breaking Kansas flood, which originated in the Kaw River area, left its mark of devastation on numerous nonmetallic-mineral producers. Many other industries and consumers which depend on these plants for materials and supplies were also hampered because of the weakening of transportation facilities. All the railroads in the area suffered heavy losses, and many were out of commission for several days.

Indirect losses—those resulting from interruption of business and commerce—added their toll to the already heavy estimated damage. Here, the loss is figured as the value of goods or services that would have been produced, but which are permanently lost as a result of interruption caused by the flood. These losses, however, cannot be readily determined, and consequently cannot be included with the material and property damages. The cost of the direct, actual destruction is estimated near $1,000,000,000 by observers.

In Kansas, which received the brunt of the damage, many quarries were almost completely inundated. At the Lehigh Portland Cement Company's quarry in Iola, Kan., the quarry was estimated to have been flooded with about a billion and a half gal. of water, according to Robert E. Jones, plant superintendent. It was possible to drain two-thirds of the water, but the remainder had to be pumped out.

As the crest of the flood moved down the Missouri River from Kansas City, which had received its worst industrial and commercial damage in more than a decade, it struck first at the sand plants along the Missouri and Mississippi River. Manager Carl Moehlenoff of the Mississippi River Sand and Material Company of St. Louis, Mo., reports that his firm was out of business for about ten days due to slime and mud collections. The St. Charles Sand Company at Normandy, Mo., and the St. Louis County Sand Company were completely flooded and out of service for practically 30 days. The Ruprecht Building Materials Company and the St. Louis Material and Supply Company, both of St. Louis, suffered damage similar to that at the Mississippi River Sand and Material Co. Hardest hit in the area, according to Mr. Moehlenoff, was Aggregates, Inc., of St. Louis. While the Mississippi River flood was at its height, all the gravel plants along the Meramec River also had flood troubles.

E. S. Albrecht, president of the Missouri-Illinois Material Company of St. Louis, reports that the damage resulting from the high water, while not inconsiderable, was not serious by comparison to the damage sustained by opertors in the Kansas City area along the Missouri River. It was further indicated by Mr. Albrecht that the biggest loss was in production time. He stated that there was a net loss of 30 operating days, during which they would normally have produced in the neighborhood of 75,000 tons of river aggregate. Many of the industries nearby were affected in the same manner. (See accompanying illustrations.)

With the exception of the general shortage of aggregates and a critical shortage of freight cars during the flood, the ready-mix producers in the St. Louis area were not harmed, Mr. Albrecht stated.

The Mississippi River reached a low stage of 10.3 ft. on March 28 and started rising. The next lowest reading on a falling gauge was 16.9 ft., recorded on June 4. The river did not fall below 17 ft. again until August 5, when a stage of 16.8 ft. was recorded. Since a river stage of 15 ft. or lower presents the best operating conditions, Mississippi River sand producers were severely handicapped for several days.

Many companies and their employees, in the face of the crisis, have done a fine job aiding the victims of the flood. The National Gypsum Company offered the full production of its big new Medicine Lodge, Kan., plant for repairs to flooded buildings in Kansas and Missouri. An emergency water supply to the residents of Bonner Springs, Kan., was arranged through a pipe-line connection with the deep wells of the Lone Star Portland Cement Co. at Bonner Springs. Trucks and employees of the Monarch Cement Co., Humboldt, Kan., went to the aid of stranded families in the area.

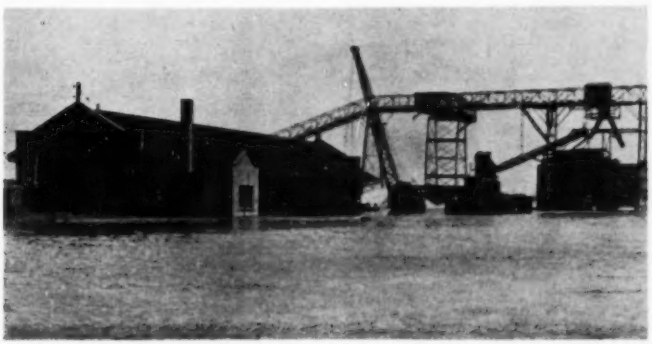
Disaster Corps., Inc., a non-profit, cooperative group, was organized in Kansas City, Mo., to clean up public flood damage. Two primary objectives of this unique group were to restore normal water service in Kansas City's central industrial district and to clear the streets as soon as possible. Disaster Corps is made up of officials of private construction firms, their top supervisory personnel and their equipment.

Walters Sand Company, Manhattan, Kan., provided a temporary setup during the flood. The mixer fleet and all rolling stock were moved to high ground in the hills. Although temporary setups like these were arranged and the task of clearing debris is well underway, it is estimated that several weeks will elapse before the operations in all locales will be functioning normally.

Left: Inside the office of the Missouri-Illinois Material Company at St. Louis was as wet as outside when the Mississippi River reached the 40.2-ft. stage.

Below, right: Missouri-Illinois Material facilities presented this watery picture at the 38.4-ft. stage.

Below, left: The Mississippi River Sand & Material Company's unloading crane could be reached only by amphibious craft.



H. B. Burks, P. E. Carlson Named to Lehigh Posts As Plant Managers

The appointment of Henry B. Burks as plant manager of the Lehigh Portland Cement Company's new plant at Bunnell, Fla., was announced recently.

Mr. Burks was graduated from Georgia School of Technology and also holds the degree of master of science in chemical engineering from Columbia

Henry B. Burks

University. He has been plant manager of Lehigh's plant at Birmingham since 1949, when he succeeded R. H. MacFetridge, retired. Employed there as plant engineer in 1937, he became assistant plant manager and supervising chemist in 1946. He is a veteran of World War II, having served from 1941 to 1946, and attaining the rank of major.

Philip E. Carlson

Philip E. Carlson has succeeded Mr. Burks as plant manager at Birmingham. A graduate of the University of Minnesota, he joined Lehigh in 1946 after having served in the U.S. Navy for four years. Prior to this promotion, he was plant engineer and supervising chemist at the Buffalo plant of Lehigh.

Upswing Noted in Production Of Many Minerals, Metals

The latest figures collected by the U. S. Bureau of Mines show an upward trend in domestic production of most of the strategic and critical metals and minerals, Secretary of the Interior Oscar L. Chapman has disclosed.

The principal factor in this trend has been a sharp upswing in the average price of metals and minerals. Another has been a feeling on the part of industrialists that defense mobilization will provide a sustained market.

The activities of the Defense Minerals Administration, an agency of the Department of the Interior, in assisting mine operators to obtain necessary supplies and equipment for maintenance, repair, and operation, contributed directly to the upsurge in mine production. The effect of its other programs—accelerated tax amortization, loans, purchase contracts, and exploration assistance—has not yet been felt directly. However, knowledge that they are being undertaken has contributed to the confidence in future prospects that has led to increased exploration and development work and increased output.

Compared with the average monthly production rates for the first quarter of 1950, May saw the output of sulphur up 6 percent. Because of the seasonal nature of iron-ore and cement production, figures on them are misleading, but the adjusted trend of production of these two commodities also is upward. Comparison of the first quarter of 1951 with the corresponding quarter of 1950, shows fluorspar output up 44 percent.

The nature of mine operation is such that the direct effect of most of the programs of the Defense Minerals Administration inevitably will not be felt for many months. Extended preparatory work almost always must precede new production. Ore bodies must be blocked out, shafts and other means of entry completed, and usually mills constructed, before production can begin.

It will be some time before mines and plants for which the Defense Minerals Administration has recommended accelerated tax amortization will be completed. Mineral deposits which may be proved under the Defense Minerals Administration exploration program will require subsequent development before they can become productive.

One of the important effects of the Defense Minerals Administration programs, will be the replenishment of mineral reserves for future years. As a result of exploration projects carried on with government assistance, the balance between production and known reserves, which is being dangerously upset by current heavy demands, may be restored.

Canada Cement Company To Raise Total Output To 17,200,000 Bbl. per Year

At a meeting of the board of directors of Canada Cement Company Limited held in Montreal, the installation of an additional kiln at Belleville, Ont., plant of the company was authorized. This will increase the output at Belleville from 2,600,000 to 3,800,000 barrels annually.

Orders have been placed for the necessary machinery and equipment, and construction will begin immediately. The new unit will be in operation by May 1, 1952, so that the increased output will be available for next year's construction season. It is expected that production in Ontario will then be quite sufficient to meet all demands.

Including this new project, Canada Cement now has under way an expansion program which will result in an increase of production of 3,200,000 barrels annually—from 14,000,000 to 17,200,000 barrels. The additional projects are at Havelock, N.B., and Exshaw, Alta. The new plant at Havelock is practically completed and will be in full operation soon; it is expected to have an annual production of 800,000 barrels.

M. B. Garber of Thew Co. Named NPA Division Chief

The National Production Authority has announced the appointment of M. B. Garber, Director of Sales of The Thew Shovel Co., Lorain, O., as director of the Construction Machinery Division of NPA, of which he had been a consultant for the last 6 months on an on-call basis.

Mr. Garber headed the Construction Machinery Division of the War Production Board during World War II.

M. B. Garber

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

LIME and agricultural limestone received considerable attention in the September, 1921, issue of PIT AND QUARRY. The feature article was a complete illustrated description of the new lime calcining and hydrating plant of the Luckey Lime & Supply Company at Luckey, O. This plant, which was hailed as an excellent example of the progress made in the lime industry in the last few years, had six Arnold vertical kilns, with provision for six more, which would double its capacity of 150 tons daily without adding to any other department. It was designed by Arnold and Weigel. The entire operation was described in detail, beginning in the quarry, where well drills and hand-loaded cars were used. Fine stone from the crushing plant was sold as crushed stone. Kiln-size stone was dumped from double-tracks for even distribution into cribbing at the top of the kilns, which insured ample storage.

The six kilns were 13 ft. 6 in. in diameter and 26 ft. high above the firing floor. They were fired through two external coal-fired furnaces with shaking grates and steam injection. At the bottom each kiln terminated in a large cooling section and the lime was drawn through air-operated draw shears. An apron conveyor carried the lime to a Williams hammermill, from which it was conveyed to a 1,500-ton ground lime silo. Screw conveyors carried this lime to a pair of Clyde batch hydrators with a combined capacity of 150 tons daily. The hydrated lime was conveyed to a pair of 250-ton seasoning tanks, where it was stored for 24 to 36 hours before being run through Raymond finishing mills. From these it went to bins over the two 4-spout Bates baggers for loading into valve bags. A Raymond tubular dust collector kept this plant clean. All buildings were of fireproof reinforced concrete and steel construction.

Agricultural limestone was one of the major products of the Charles Stone Company plant at Whitehall, Ill., which was also described. A feature was the track scale used for weighing quarry cars, and there was also a 200,000-lb. track scale for weighing out railroad cars.

Another article on agstone told how six county agricultural agents in the Terre Haute, Ind., area decided that limestone was one of the chief limiting factors in putting their counties on a profitable farming basis and that it would become a major part of farm bureau activities in their counties. A survey was made and soil samples were obtained which showed that in these six counties only 210,000 tons of agstone were used in the last 5 years, whereas a total of 2,000,000 tons was needed to bring the soil up to par. It was also decided that there was need for agstone storage bins on railroads at various locations from which farmers could obtain any amount needed at any time and which would make it possible for producers to extend their operating seasons and as a result lower their selling price.

The first lime bin was established in January, 1921, at Russellville, and the movement of agstone was active from the start. In August of that year a demonstration was held to show how farmers came in to get agstone. Talks were given by authorities on liming, including C. R. Wagner of the National Agricultural Limestone Assn., who also gave farmers advice on the use of agstone. About 700 farmers attended and great interest was created.

Other major articles in this issue included a staff article on how to start in the sand-and-gravel business with limited capital, on the need for institutional management in business, and on what kind of contract exists when you give a man a job. Another article described the benefits a producer had obtained by using trucks for hauling from the quarry to the plant, then not a common procedure. No favoritism was shown, however, as there was also a detailed treatise on how to operate locomotives on superheated steam. In the news were many items, one of the most interesting telling how one producer used his own aeroplane to hasten a much-needed part to his plant.

A. J. R. Curtis, Ivan LeGore Appointed to New P.C.A. Posts

A. J. R. Curtis, nationally known in industrial safety circles and in charge of the Portland Cement Association's Accident Prevention Bureau for the last 25 years, has assumed new duties as assistant secretary and safety consultant.

The move, which became effective August 1, will relieve Mr. Curtis of responsibility for the active management of the association's Accident Prevention Bureau, and will enable him to devote his time to many of the broader problems of the association, including safety matters.

Ivan F. LeGore, who since 1944 has served as assistant manager of the Accident Prevention Bureau, has been appointed manager of that Bureau.

Mr. Curtis has been with the association since 1916. He was director of extension for P.C.A. from 1916-1920, and manager of its Cement Products Bureau from 1920 until 1926, when he was appointed assistant to the general manager of the association, in charge of its Accident Prevention Bureau. In 1947 he was awarded the Joseph H. Holmes medal of the U. S. Bureau of Mines for his leadership in this outstanding safety work.

Mr. Curtis was secretary of the Cement Section of the National Safety Council for 16 years, and for many years was a member of the executive committee and of the board of directors of that organization. He has served as a member of the President's Conference on Industrial Safety and is affiliated with the Industrial Hygiene Foundation, the American Industrial Hygiene Association, and the American Society of Agricultural Engineers.

Mr. LeGore joined the association in 1936 as a member of the staff of the Accident Prevention Bureau, and has since served in that bureau with the exception of two years during World War II, when he headed the protection program of Curtiss-Wright Corporation's Airplane Division at Buffalo, N. Y. Prior to joining the association staff, Mr. LeGore had an extensive experience in safety work and was associated with the Safety and Health Division of Western Electric Company's Hawthorne Works in Chicago.

Ivan F. LeGore

A. J. R. Curtis

Ideal Completes First Phase

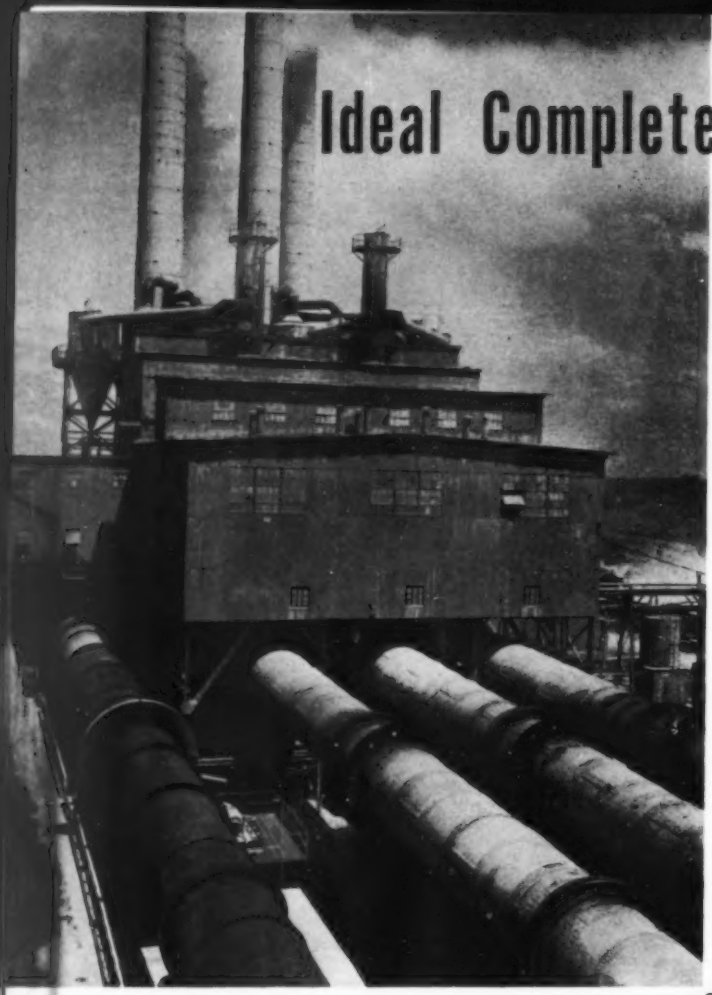
BY

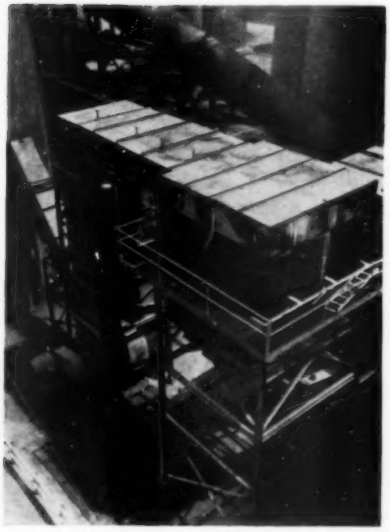
WILLIAM M. AVERY

another ON THE SPOT report

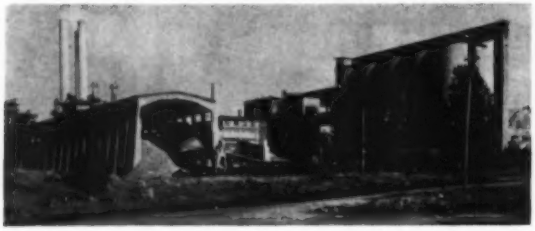
WHEN we visited the Ada, Okla., plant of Ideal Cement Company several weeks ago, the initial phase of a broad program of expansion and improvement, including the installation of a new 10- by 250-ft. rotary kiln, had been completed, and much of the work on a second phase of the same program was already well advanced. When all of the proposed work is completed, probably late this year, major additions or changes will have been made in virtually every department of the plant.

The new Traylor kiln, which supplements the output of three Worthington kilns of about the same size installed when the plant was built over 30 years ago, has added approximately 1,600 bbl. per day of capacity. Since the kiln went into operation in February of this year, the company has made extensive repairs to each of the three older units.





ABOVE: General view of the four rotary kilns at the Ada, Okla., plant of Ideal Portland Cement Co., with new 10- by 250-ft. kiln at left. THREE PICTURES AT RIGHT: View of dust collector through which kiln gases are drawn by induced draft fan shown below. Firing end of new kiln which is fed by natural gas at 40 p.s.i. after reduction from 100 p.s.i. Instruments on new control panel include a rear-end temperature recorder, revolution counters for the ferris-wheel feeder and the kiln itself, and draft gauges which show hood draft and kiln differential draft. BELOW: General view of the plant showing the raw material storage building at the left, and on the far right, the 10 silos used for storing clinker ahead of the finish mill.



Of Expansion Program At Ada, Okla.

WITH NEW KILN IN PRODUCTION AND 3 OLDER KILNS OVERHAULED

SECOND PHASE CONCENTRATES ON FINISH GRINDING DEPARTMENT

We are now advised, however, that the four kilns are in operation and are meeting the expected total output of 6,700 bbl. per day.

Several factors led the company to plan and execute the expansion program in two stages, but the primary consideration was to get additional capacity as quickly as possible to help ease the cement shortage. For this reason, in the initial phase of the program, principal effort was focused on the construction of the new kiln, and on the installation of an additional raw grinding mill to assure an adequate supply of slurry. When this hurdle had been successfully cleared several months ago, attention was immediately turned to other departments of the mill which it was realized would be overtaxed by the increased burning capacity. Fortunately, some unused finish grinding capacity was available in a separate mill which had been used for some years to grind masonry cement, and additional leeway was anticipated as a result of the need for major work on the older kilns. By timing the latter undertaking to coincide with the firing up of the new kiln, the entire project to date has been carried out without loss of production.

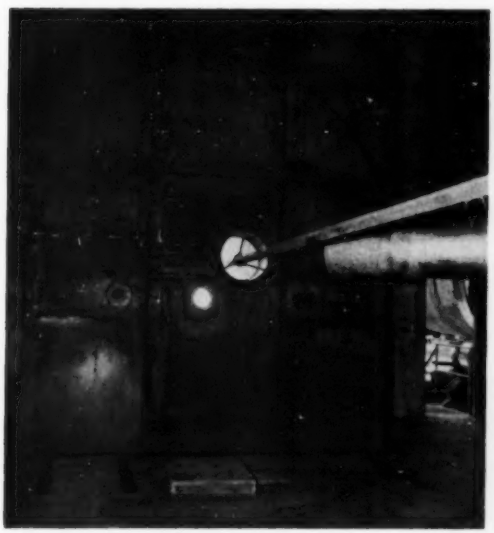
New Kiln The new gas-fired kiln at Ada is a 10- by 250-ft. Traylor unit. The all-welded steel shell is supported on four piers, and it is pitched ⅜ in. per ft., as compared with ½ in. per ft. on the older units. It has a 40-ft. spiral chain section, the first 15 ft. of which is lined, while the remainder of the shell under the chains is unlined.

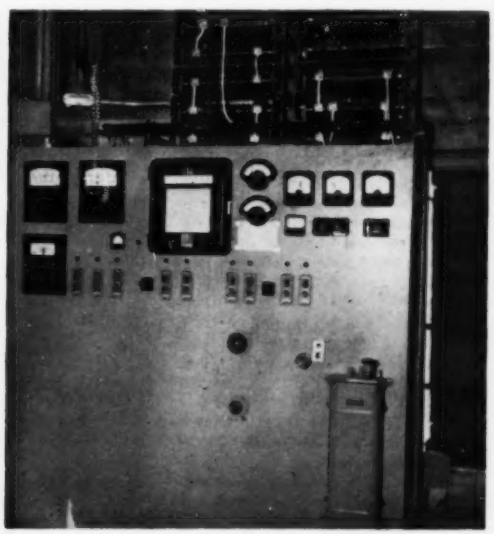
No. 4 kiln is driven by a 125-hp. General Electric slip-ring motor through multiple V-belts and a Falk 12½ G.D.A. reducer to a pinion and a conventional girth gear on the kiln shell. The speed of rotation ranges from a high of one revolution in 56 seconds to a low of one revolution in about 85 seconds.

The kiln is fed directly with a Stearns-Roger Ferriswheel feeder. As stand-by equipment there is also a Dorrco pump, which is connected to the Ferris-wheel feed tank for pumping the slurry into the kiln in the event of an interruption in the operation of the regular feeder.

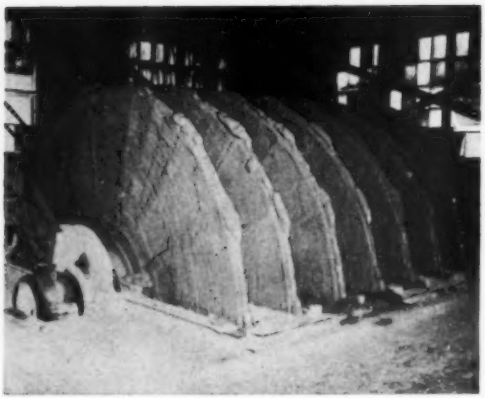
The cooler for No. 4 kiln is a 4-ft. 6-in. by 70-ft. Allis-Chalmers air-quenching unit. It is controlled automatically by under-grate air pressure and fan air flow actuating diaghragms which control the variable-speed-drive. The clinker is discharged over a steel-rail grizzly into the same drag chain which serves No. 1, No. 2, and No. 3 kilns.

Gases pass from the kiln through a conventional feed housing into a six-cyclone Buell dust collector which removes approximately 85 percent of the dust. The recovered dust is returned by means of a 12-in. screw





The new 8- by 30-ft. 3-compartment ball mill in the raw grinding department. This mill has a capacity of about 100 bbl. per hour.



Two 10-ft. diameter 8-disk filters operate in parallel ahead of each of the three older kilns.

conveyor to the dust-handling system which serves the three older kilns. From the collector the gases pass through an American Blower induced-draft fan which discharges into a concrete scrubber, where the remaining dust is washed out by means of water sprays.

Controls on the new kiln include a Leeds-Northrup rear-end temperature recorder, a speed indicator and revolution counter for the Ferris-wheel feeder, a revolution counter for the kiln itself, and Hays gauges for indicating hood draft and kiln differential draft. The Ferris-wheel feeder and the kiln are not synchronized, either mechanically or electrically.

Quarry Both limestone and shale for operations at Ada are quarried near the town of Lawrence, Okla., about seven miles southwest of the cement plant. The limestone is hauled by means of a Woodford car system to a crushing plant located in the quarry, and then loaded into railroad cars for shipment to Ada. Crushing facilities at the Lawrence quarry consist of a primary jaw crusher and hammermills.

The shale is relatively soft and requires little crushing. It is transported to the cement plant unprocessed, and any crushing required is done with a No. 6 Williams hammermill and/or a roll crusher, both located in the stone storage building.

Since quarry capacity was more than adequate to supply the increased supply of raw stone for the new kilns, no important additions have been made in this phase of the operation. Recent purchases of major equipment for the quarry, however, include a new 3½-cu. yd. Marion Electric shovel and a new 25-ton General Electric diesel-electric locomotive.

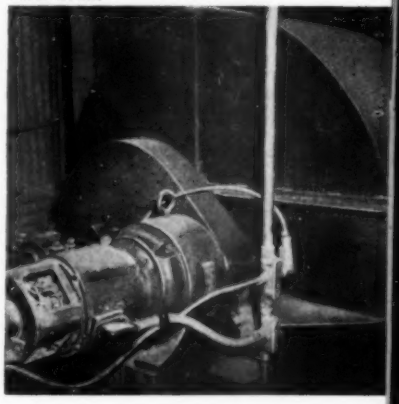
Raw Grinding All stone and shale are brought into the raw storage building at the cement plant on an elevated track. The materials are clamshelled from the cars by means of an overhead traveling crane. Separate belt feeders withdraw the stone and shale from the storage piles, discharging into a common 24-in. Webster bucket carrier which delivers the materials into the raw mill building. The bucket carrier discharges onto belt conveyors, which in turn deliver the materials to bins located over the mills. Two of the three belt conveyors in this handling system were installed as part of the expansion program.

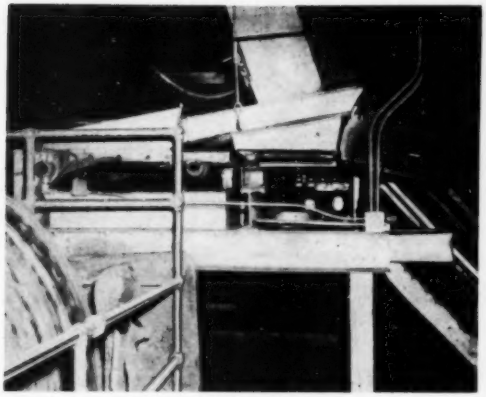
The raw grinding department consists of three 7- by 26-ft. Allis-Chalmers two-compartment mills, and one new 8- by 30-ft. Traylor three-compartment mill installed to provide the additional capacity required by the new rotary kiln. The mills are all straight open-circuit grinders, the three smaller units having a capacity of about 70 bbl. per hr. each, as compared with an output of approximately 100 bbl. per hr. from the new mill. The older units are fed by means of table feeders through an internal screw which takes the feed from the tables through the mill trunnion, while the new unit is equipped with a drum feeder, and the feed through the trunnion is integral with the mill. The new mill is fed from a 150-ton steel bin, and both the mill and bin are housed in an extension of the former raw grinding building.

Material is pumped from the underground tanks with either of two 6-in. Wilfley pumps which discharge into four 30- by 33-ft. concrete tanks equipped with Dorr agitators. These tanks are located above grade, and they have a capacity of about 2,000 bbl. each. Corrective material can be pumped to any one of the four tanks before the slurry is pumped to either of two kiln feed tanks located under the kilns. Only one tank is used for feeding the kilns at any given time, the slurry being withdrawn into either of two 6-in. Wilfley pumps and sent through a header pipe which is common to all four of the kilns. The header delivers the slurry to disk filters ahead of the three older kilns, and to a Ferris-wheel feeder ahead of the new kiln.

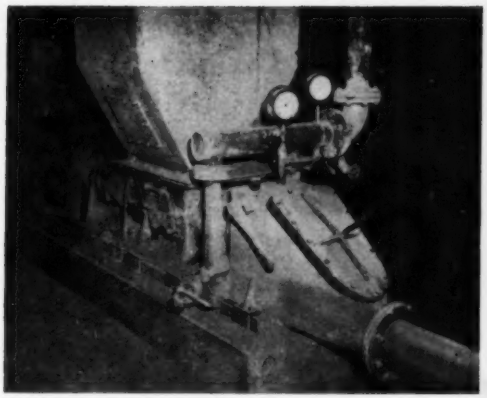
Kiln Feeders Each of the three older kilns is served by two sets of 10-ft. diameter Oliver 8-disk filters arranged in parallel. Moisture content of the filter cake

The new kiln is fed directly by this ferris-wheel feeder.





One of the two feeders which feed clinker and gypsum to No. 4 finish mill.



No. 4 finish mill is tied in with a pumping system so that special grinds can be pumped directly to the storage silos.

from these units runs approximately 20 percent, and is fairly independent of the moisture content of the slurry. The cake drops from the filters onto belt conveyors, two of which deliver the material to Bessemer feeders ahead of two of the kilns. In the case of the third kiln the filter cake is discharged into a pug mill in which it is thoroughly mixed with dust returned from the waste heat boiler pits and kiln dust collectors.

The pug mill discharges directly into the kiln, the feed running 15 to 18 percent moisture, depending on the amount of dust added.

Old Kilns The three older kilns were installed when the plant was built in 1918. All three are Worthington kilns and are lined throughout. Two of the units are 10 by 250 ft. and the third is 11 by 10 by 250 ft. Their total output averages about 5,000 bbl. per day.

No. 1 kiln discharges into a 6- by 20-ft. Fuller inclined-grate cooler, whereas No. 2 and No. 3 kilns discharge into Lee Process coolers. The coolers all discharge into 15-in. drag chains, which deliver the clinker to either of two bucket elevators.

Finish Grinding Finish grinding is a single-stage operation involving four 7- by 26-ft. Allis-Chalmers two-compartment mills, which are housed in the same building with the raw grinding mills. Clinker from all four of the kilns is elevated in either of two 24-in. bucket elevators and discharged onto a 16-in. drag chain conveyor which feeds the four finish mill bins. The bins have a capacity of about 300 bbl. each.

Clinker and gypsum are fed separately to each of three mills by conventional table feeders, and to the fourth mill by individual Jeffrey Waytrol feeders. All the feeders discharge into screw conveyors which pass through the mill trunnions. Three of the mills are close circuited through an arrangement of screw conveyors and bucket elevators with two 14-ft. air separators—one a Sturtevant unit and the other a Raymond unit. The fourth mill is close circuited within itself by means of a screw conveyor, a bucket elevator, and a 14-ft. Sturtevant air separator.

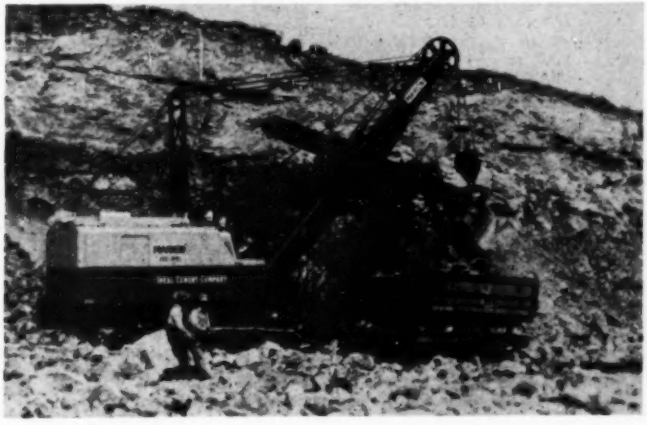
Finish mills No. 1, 2, and 3 are airswept by a 40-ft. Norblo automatic bag-type dust collector, while No. 4 mill is served by a 20-ft. collector of the same type and make. Under normal conditions the collectors provide all the cooling required by the mills, but spray pipes are available for external cooling of the mills when required.

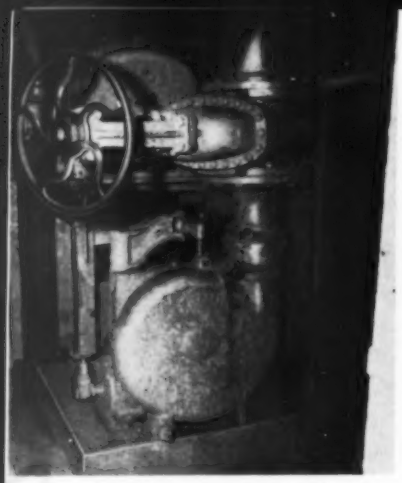
Dust from both collectors is discharged into the screw conveyor which collects finished cement from the separators.

Rejects are returned from the air separators to the mills for regrinding, while the fines are collected in a screw conveyor, then elevated and fed into either of two identical handling circuits—one serving the north side and the other the south side of the storage silos. Special grinds can also be pumped directly to the storage silos by means of a 5-in. Fuller-Kinyon pump which is tied in with the No. 4 mill.

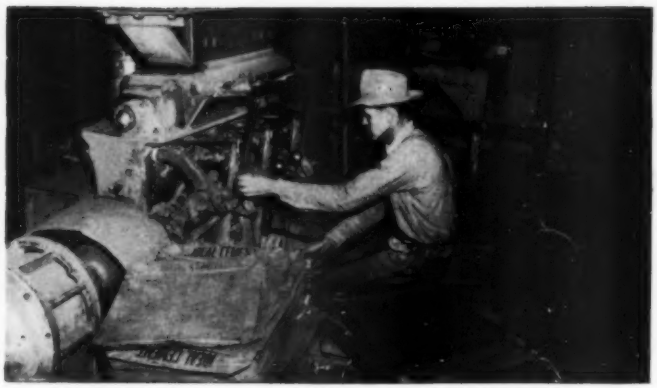
The four finish grinding mills in service at present will not handle the full clinker output of all four kilns, but a second phase of the plant expansion program is already in progress to correct this situation. During the interim period clinker in excess of the amount which the present four mills can handle is being ground by a 7- by 26-ft. Allis-Chal-

View of the new 3½-cu. yd. electric shovel operating in the quarry at Lawrence, Okla. An electric car system hauls limestone to a crushing plant located in the quarry.





One of the numerous pumps used for pumping slurry to the various tanks.



One of the six 3-tube packing machines in the pack house. Two additional 4-tube machines will be installed before the end of the year.

mers two-compartment mill which is a hold-over from the original dry process plant at Ada. The latter mill, located in a separate building apart from the present plant, has been used for several years for grinding masonry cement.

Work is already in progress on the installation of an 8- by 30-ft. Traylor three-compartment ball mill which will restore a desirable balance between clinker output and finish grinding capacity. This installation will include a 16-ft. Sturtevant air separator, Jeffrey Waytrol feeders for both clinker and gypsum, and other auxiliary equipment for closed circuit grinding. An additional 14-ft. Sturtevant air separator will also be installed to permit each of the existing mills to operate in a separate closed circuit.

Two 8-in. Fuller-Kinyon pumps served by C-250 Fuller rotary compressors are being installed to handle the cement from all five of the separators. When this work is completed, all cement will be pumped from the finish mill directly to the storage silos. Existing elevators and screw conveyors in the present cement-handling system will be retained as stand-by equipment.

The increased capacity of the finish mill will be adequate to handle masonry cement in addition to the various types of portland cement. This change will eliminate the rehandling of materials necessitated by the present practice of grinding masonry cement in a separate department. A new track hopper and a limestone dryer will be installed adjacent to the mill building, and the dried masonry material will be stored in an existing concrete silo.

The gypsum-handling system is also slated for some changes. A track hopper is being installed to facilitate unloading, and the material will be handled by means of a Jeffrey vibrating feeder, a new 30-in. belt conveyor, and a 16-in. bucket elevator discharging into the present gypsum storage bin.

Clinker Handling The expansion program also calls for reactivation of an existing clinker storage system which has been out of service for a number of years. The system includes ten silos and four star bins. The work of placing this storage system back in service includes the installation of a stand-by drag chain conveyor to receive the discharge of the coolers serving kilns No. 1, 2, 3 and 4, and additional bucket elevators and drag chains to place clinker in the silos.

Two of the silos will be equipped with 24-in. Merrick Feedoweights, so that clinker and limestone can be withdrawn and sent to the finish mill bins in the proportions required for the manufacture of masonry cement. The Feedoweights will discharge onto the same 30-in. belt conveyor which handles clinker and gypsum from the remainder of the silos. The complete handling system from the clinker elevator to the clinker storage silos and back to the finish mill will replace the present 12-in. Webster bucket carrier.

New Norblo bag-type dust collectors are also to be installed in connection with the finish mill expansion program. One of these units will air-sweep the new 8- by 30-ft. Traylor mill; another will collect clinker dust from the various drag chain conveyors and bucket elevators in the clinker handling system; and a third will operate in conjunction with a cyclone collector to serve the new limestone dryer. An existing 40-ft. collector in the finish mill will be divided to serve two of the existing mills, and one additional 20-ft. unit is being installed so that each mill will be tied in to its own collector.

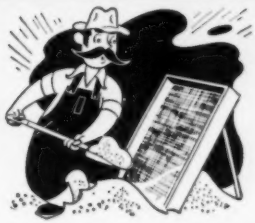
Packing Plant The cement storage system at Ada consists of three rows of four silos having a total capacity of 240,000 bbl. The Company has no plans for creating additional storage capacity now, but several changes will be made in the packing plant. Masonry cement, which is at present packed at the location of the mill used for grinding the product, will upon completion of the present program be handled in the main packhouse. One silo and two of the present 3-tube packers will be assigned to masonry cement, exclusively. A complete separate conveying, elevating, and spill return system will be used. Other types of materials will continue to be packed with the same six 3-tube machines as in the past.

The arrangement of the packhouse is such that any type of cement can be packed and loaded out from either side of the building. Some remodeling of the present bulk handling arrangement is planned in order to facilitate the handling and loading of bulk cars. Two existing screw conveyors will be enlarged to speed up bulk loading.

Work in this second phase of the expansion program at Ada is scheduled for completion by the end of this year. Deliveries of equipment in general, and of switch gear in particular, will largely determine the completion date. The addition to

(*Continued on page 84*)

Screenings



by William M. Avery

ACCORDING to a spokesman for the National Bureau of Standards, men's and women's clothing may in the not-too-distant future be made partly of sand. It seems that experiments are in progress with silicon that may permit finely powdered-sand to be

used in synthetic clothing materials as a heat resistant factor.

This development is certain to be of considerable interest to those who take a glum view of their prospects in the hereafter. Others will no doubt be intrigued by the possibility that swimming suits may some day in effect incorporate their own beaches—that is, if the development gets that far before swimming suits disappear altogether. Another provocative possibility is that small fry may some day be sent out to play in snow suits that will function as perambulating sand boxes. And if the little woman should on occasion cook a batch of spinach that contains no sand, the stuff can be restored to an edible condition by the simple expedient of shaking an apron over it. Gad! The possibilities are enough to stagger the imagination.

Shot Gun Wedding

AN item in the Seattle *Times* states that when striking cement-plant workers and their employers failed to reach an agreement at Polpaico, Chile, the government ordered the men back to work and named a military mediator. This blunt approach to the problem of settling labor disputes would probably run into some serious snags here in the U.S.A., but it has its points.

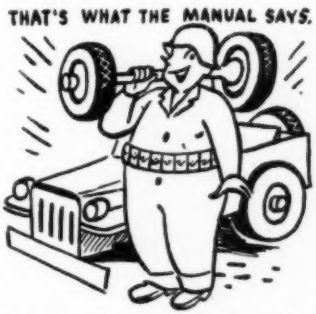
Who's Batty?

SOME 15,000 bats have been evicted from an abandoned limestone mine near Utica, Ill., which has just been leased by American Records Depositories, Inc., of Chicago. The firm will rent space in the mine to insurance companies and various government agencies for the protection of important records in the event that comrade Joe starts flinging the A-bomb around.

The bats, we are advised, had enjoyed the undisturbed freedom of the mine for half a century, except for a brief interlude during the prohibition era, when moonshiners used it for the operation of a sizable still. There was, presumably, no conflict of interests in this earlier double occupancy, and we'll be hanged if we can see any in the present situation. The whole business is so completely batty that we'd expect the new tenants and the old could get along in complete harmony—that is, unless the bats objected.

The Military Mind

THOSE of our readers who admire, as we do, the unfettered prose that bobs up every now and then in the technical manuals of the War Department, will treasure the



following bit of instruction on the operation of front-axle drives: "Front axles should be disengaged except when extra traction is required . . . this does not apply to vehicles on which front axles can not be disengaged."

Although the exception noted seems reasonable enough, we'd like to believe that the Army can damned well disengage its front axles even if they're already disengaged.

Busy Beaver

THE cement shortage continues to make news of a sort. The other day an energetic thief drove his own truck and trailer up to a Santa Fe boxcar at a siding in Dallas and began tossing out 94-lb. sacks of cement as though his life depended on it. Two railroad detectives admired his activities for about ten minutes, and then made the pinch.

In ten minutes the busy gent had unloaded 86 sacks, or 8,084 lb., of cement. This is equivalent to 516 sacks per hour, or about five times the average hourly rate for men hired to do the same work. If those dumb detectives had let the fellow alone for a few hours, he would probably have earned enough to pay his fine and set himself up in business.

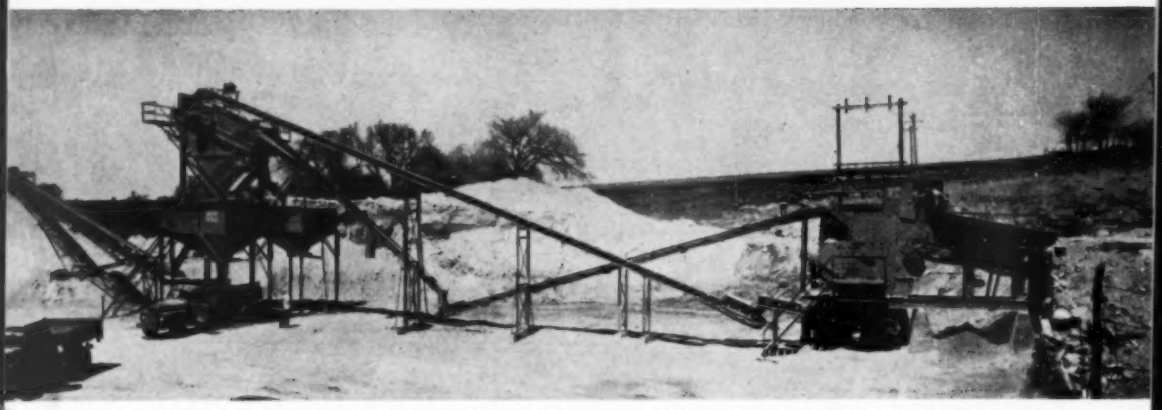
Hell's Fire!

FROM Ottawa, Canada, comes the startling news that sulphur and brimstone have been placed under import control. Canadians who expect to do a bit of roasting in the hereafter are advised to cart along their own materials.

History Lesson

"INDIANS in New Mexico", states a news item in the Evansville, Ind., *Courier*, "were building successfully with stone, using clay mud for mortar, when the first white explorers arrived more than 40 years ago."

Just to shed a bit more light on the matter, we'd like to add that this all happened shortly *before* they jumped into their Maxwells and moved east to become known as the Cleveland Indians.



This general view of the Dillon, Sharpe & Company plant near Columbus Junction, Iowa, shows the simplicity of the single-crusher closed-circuit setup. Crusher is at right; screen, bins, and portable conveyor for stockpiling agricultural limestone is at left. Stockpiles behind inclined conveyors in center of picture are also agricultural limestone.

Fast, Uniform Limestone Production

another ON THE SPOT report

NEAR Columbus Junction, Ia., in mid-April of this year, Dillon, Sharpe & Company put into operation a new simplified, close-circuit setup that takes quarry-run limestone, which in this case is anything that will go into a ¾-cu. yd. bucket, and in one pass through a single crusher produces clean, cubical aggregate all 1½-in. or smaller.

The single crusher responsible for this performance is the new Pettibone Mulliken Impact Master Model 3240, with a capacity between 200 and 250 t.p.h. Taking stone up to 50-in. long that will pass through a 32- by 40-in. opening, this crusher makes a product of approximately the following screen analysis: 28 percent minus 1½-plus ¾-in., 38 percent minus ¾-in. plus 4-mesh, and 34 percent agricultural limestone, which must be 80 percent passing a No. 8 screen to meet Iowa specifications.

After a year in partnership at Centerville, Ia., William D. Dillon and William F. Sharpe moved their crushed stone and agricultural limestone operations to their present location in October, 1945. About a year ago Mr. Dillon bought out his partner's interest, and as sole owner and operator of the company installed all new equipment except for a Keystone well drill, a Haiss loader, a Caterpillar tractor, and one quarry truck.

The deposit being worked by the company is a part of the Burlington limestone formation, which had already been partly quarried to a depth of some 30 ft. by previous operators. Geological explorations indicated that the deposit contained limestone of good quality at depths of 100 ft. or more; so a 7-acre tract containing reserves of approximately 2,000,000 tons was leased.

Depending upon the depth of the working face, both a two-lift and a single-lift system are used in quarrying. Overburden ranging from 18 to 20 ft. in depth has been removed from a considerable portion of the 7-acre tract, and at present stone is being removed both from above and below the former 35-ft. floor which roughly marks the dividing plane between the upper brown stone and the gray stone found at greater depths.

The upper material, which runs from 15 to 18 ft. in depth, is considerably softer than the gray stone, and has a good $MgCO_3$ content. It makes a high-grade agricultural limestone, although at first the farmers in the area were somewhat hesitant about using the material. Mr. Dillon solved this problem of farmer resistance by an advertising campaign that stressed the value of a brownish, richer-looking material.

The lower stone, which runs from about the 35-ft. level down to 100 ft., is considerably harder, and while it makes a good agricultural limestone, testing 90 to 91 C.C.E., it is especially good for black top, cover, asphaltic material, and concrete stone. A mixture of the two types of stone makes an excellent road surfacing material.

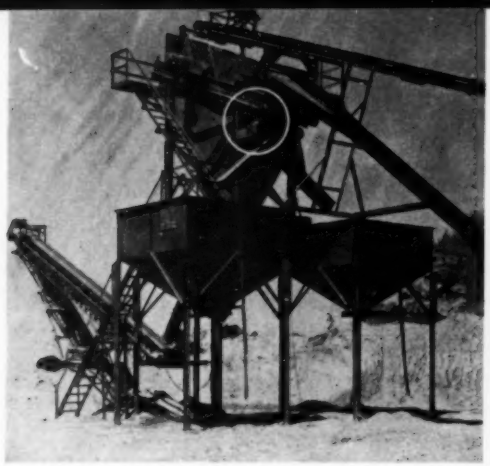
Drill holes for blasting at the quarry are 6 in. in diameter and are put down with a Keystone Model 51

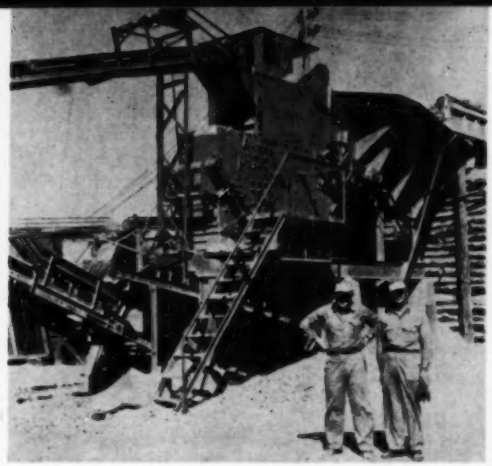
By L. T. Heard

AT LEFT: Quarry shovel loading stone onto one of the three company trucks.

AT RIGHT: Loading roadstone from one of the stockpiles. The company contracts the trucking of roadstone as well as the spreading of agricultural limestone.

AT FAR RIGHT: Dumping a load of quarry-run limestone into the crusher's apron feeder.





LEFT: Close-up view of the three-deck screen and the three 23-cu. yd. bins. Circle in upper center of picture encloses the electric-powered oiler that lubricates screen bearings when screens are operating. RIGHT: Close-up view of the single crusher, showing apron feeder, crusher conveyor, and the crusher ends of inclined conveyor to screens and return conveyor. In right foreground are William D. Dillon, owner and manager, and John Dillon, superintendent.

Achieved With Single Crusher Setup

well drill. For a single-lift operation, only one row of holes is used. Where benching is in progress, multiple rows are shot using DuPont delay caps. Holes are spaced 16 ft. apart and 12 ft. in from the face. The working face of the quarry is about 130 ft. long.

A Koehring Model 304 shovel with a ¾-cu. yd. bucket loads 100 to 150 tons of stone onto one KB6 International and two new Ford trucks every working hour. The amount of stone moved by the shovel determines the tonnage output of the crushing plant, because the Impact Master, with its ability to produce 200 to 250 tons per hour, can take all the stone the three trucks can haul to it, even with their short runs and 6- to 6½-ton loads.

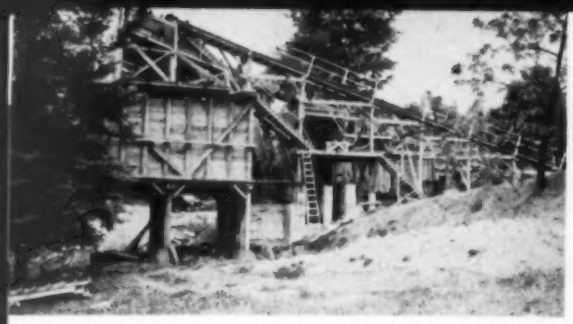
Stone is dumped into a 36-in. by 12-ft. apron feeder which feeds the crusher through a 32- by 40-in. opening. With only two moving parts —hammer rotors rotating in the same direction with the flow of the material—and three possible adjustments, the crusher turns out a uniformly graded aggregate in one pass.

Inasmuch as the plant produces the same product the year 'round, the crusher was installed without specific provision for speed adjustment. However, speed changes can be made simply by changing one sheave. Driven by two motors—60- and 75-hp.—the rotors turn at approximately 700 r.p.m. Both motors drive the secondary rotor which is belted to the first rotor.

Two other adjustments, besides speed, control the size of aggregate issuing from the crusher bottom. One, the bottom screen grate adjustment, can be made while the machine is operating. The second adjustment, at the stripper bar, requires a shutdown of approximately 30 minutes. Under normal operating conditions more than 90 percent of the feed is reduced to minus 1½-in. in one trip through the crusher. Rejects are reduced completely in the second pass.

Stone falls from the bottom of the crusher onto a 30-in. by 16-ft. inclined Universal conveyor driven by a 7½-hp. electric motor, which in turn feeds a 24-in. by 100-ft. inclined conveyor powered by a 15-hp. motor. The latter discharges onto a 5- by 14-ft. 3-deck Simplicity screen. Oversize rejected by the top 1½-in. screen falls through a chute onto an 18-in. by 62-ft. return conveyor, powered by a 5-hp. electric motor. A vertical chute from the oversize

(*Continued on page* 84)

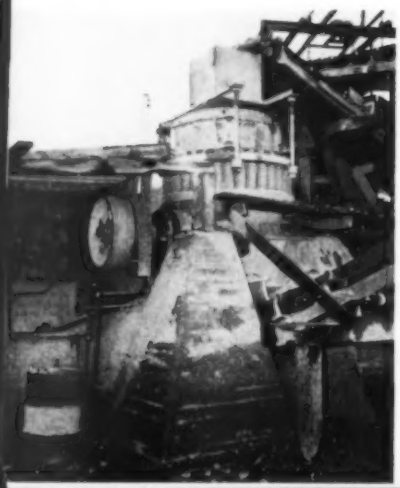


The new crushed stone plant of Brooks Sand and Gravel Company under construction west of Kingsport.

General view of the Brooks Sand and Gravel Company plant with truck dumping to primary crusher feeder at right.

ABOVE: Sand tower with two single-screw washers and fine separator above them.

BELOW: The 4-ft. standard cone reduction crusher.



Old Creek Bed—

New Sand and Gravel Plant

By WALTER E. TRAUFFER

another ON THE SPOT report

THE growth of the aggregates industries in this country to supply the steadily increasing demand through the years is typified in the growth of the Brooks Sand and Gravel Company of Kingsport, Tenn. This company operates several aggregates plants in this mountainous northeastern corner of the state which was once noted largely for its scenery but which has experienced an industrial boom in recent years. This company was formed in 1930 to operate a sand and gravel plant at Kingsport. Later a ready-mixed concrete plant was built there, followed by a sand and gravel plant at Lenoir City, 25 miles southwest of Knoxville, and a crushed stone plant 5 miles south of Johnson City, which is 20 miles southeast of Kingsport. In 1940 the sand and gravel plant at Kingsport was moved to Erwin, about 15 miles south of Johnson City. This Erwin plant was rebuilt late in 1950 and it is with this operation that this article is chiefly concerned. A new crushed stone plant has just been completed about 5 miles west of Kingsport and in it is being utilized much of the equipment from the old Erwin plant.

The old sand and gravel plant at Erwin had a capacity of about 500 tons in an 8-hour day which became insufficient to meet the growing demand, especially for railroad ballast. The new plant, with its 1000-ton-per-day capacity, is expected to take care of demands for some time to come.

The deposit is an old creek bed northwest of Erwin and just inside the city limits. The material was a trifle coarse for ordinary demands and some sand had to be manufactured. Now, with ballast forming the major part of the output there is ample sand for concrete needs. There is the usual drainage problem found in a pit of this type when it is excavated below the creek level. A 12-in. sand pump at the low end of the pit is adequate for the job even during rainy seasons. This is driven by a 150-hp. Buda diesel engine.

A ¾-cu. yd. Lima diesel shovel loads sand and gravel into a fleet of five dump trucks which haul about 3/10 mi. to the plant. There they discharge from a one-way earthen fill onto a Pioneer apron feeder followed by a 20- by 36-in. Pioneer jaw crusher. The crusher is V-belt driven by an 85-hp. motor and the feeder is chain driven from the crusher. A clutch makes it possible to cut off or control the feed as desired.

The minus-4-in. product of the crusher is carried on a 30-in. belt conveyor to a 4- by 14-ft. Screen

One of the ½-cu. yd. shovels used for loading out of stockpiles. The ¾-cu. yd. shovel loading a truck in the pit after a heavy rain.

Equipment Co. Seco 3-deck screen. This ordinarily has 1¼-, ⅜- and 3/16-in. wire cloth on its top, center and bottom decks, respectively. A short 30-in. inclined cross belt conveyor carries the 1¼- to 4-in. oversize off the top deck to the 4-ft. Symons standard cone reduction crusher. A short inclined return belt conveyor carries the minus-1¼-in. product of this crusher back to the main conveyor, forming a closed circuit. The 1¼- to 3/16-in. gravel (ballast) off the second and third decks of the screen is carried on a short horizontal belt conveyor to a 30-in. inclined conveyor which discharges it into a 40-cu. yd. wooden bin. Railroad cars are loaded on a gravity track alongside the bin and trucks are loaded under it. Trucks are used for delivering only when concrete aggregates are being produced, usually they are used for stockpiling ballast for later reloading into cars.

The minus-3/16-in. material through the bottom deck of the screen is sand. It is chuted into a settling tank from which a 6-in. Erie pump transfers it through a 6-in. pipe to the sand tower. There the sand is split to a pair of Eagle Iron Works single-screw washers, one 20-in. and the other 22-in. in diameter. The finished and dewatered concrete sand drops into a 40-ft.-high stockpile surrounding the tower.

The overflow from the washers goes into a tank from which a 4-in. Erie sand pump feeds it into a Cottrell Whirlcone separator above the screws. This separator is a comparatively recent development and has no moving parts. The pump line discharges the water and suspended fines into the inlet near the top of the separator at high velocity. It is then "whirlconed" through a spiral chamber to the bottom section of the separator where the material is deslimed and separated. The sand drops from the bottom of the separator onto the stockpile. The slime — silt and fine sand — is carried with the water to the top section of the separator through a central overflow pipe by the suction created by elevating the cone above the waste outlet. This material flows through a pipe to a waste ditch from which clear water overflows into the creek. An adjusting valve raises or lowers the central overflow pipe to control the size of the sand produced. A special gate regulates the flow of sand.

A ½-cu. yd. Koehring 205 shovel with an International gasoline engine loads from the gravel piles into cars or trucks. A ½-cu. yd. Lorain 75 crane is also used for this purpose, usually loading from the sand stockpile into trucks. There is a shovel attachment for the latter machine so that it can be used in the pit if necessary. A Dempster Dumpster is used for cleaning up about the plant. Wash water for the screens and for the sand classifiers is provided from the creek by a 6-in. Fairbanks-Morse centrifugal pump direct driven by a 25-hp. motor of the same make. Hewitt-Robins belt conveyor idlers and pulleys and New York Rubber conveyor belts are used throughout and these are mounted on steel trusses on wooden bents.

The new crushed stone plant west of Kingsport has a capacity of 600 to 800 tons daily. It is located on a hillside and the quarry is being developed at the primary crusher level. The equipment consists of a Tyler scalping screen, a 24- by 36-in. Kennedy-Van Saun jaw crusher, a 6-in. Allis-Chalmers gyratory crusher, a 4-in. Symons cone reduction crusher, and two sizing screens.

The company's main office is located in an attractive building in a new business area near the outskirts of Kingsport. The officers of the company are: H. C. Brooks, president and general manager; C. E. Brooks, Jr., vice-president; J. V. Lady, secretary-treasurer and general sales manager. George R. Harris is general superintendent and Glenn Laws is his assistant.

ABOVE: The 6-in. pump which feeds sand from tank to the sand tower.

BELOW: Close-up of the apron feeder and the 20- by 36-in. jaw primary crusher.

BELOW: The 4- by 14-ft. 3-deck screen which does all gravel sizing for this plant. Below it is sand tank for pump.

Crushed Stone and Bituminous Material—A Good Production Team

By WALTER E. TRAUFFER

ON THE SPOT REPORT

FOR obvious reasons the production of bituminized aggregates has become more and more a function of the aggregate producer, especially the producer of crushed stone. Many of the permanent commercial plants are now located at or near a quarry or crushed stone plant and most of these are operated either as a part of or as an affiliate of the stone company. This location of an aggregate bituminizing plant near the source of supply of its chief ingredient is, of course, dependent upon that source being near a market for the product.

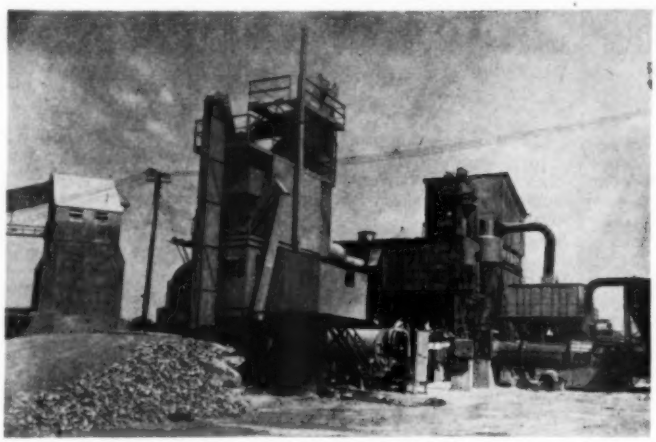
The operations of the Buffalo Crushed Stone Corporation at Bowmansville, N. Y., 12 miles east of downtown Buffalo, provide an example of an ideal combination of crushed stone and bituminized aggregate production. At that location the corporation operates a 3,000-ton-per-day crushed stone plant and three aggregate-bituminizing plants with a combined capacity of well-over 2,000 tons daily. The latter plants are notable, as a group, not only for comprising one of the largest and most modern operations of this kind in existence, but they were also among the first such plants to have bag-type dust collectors, and they recently were equipped with the first installations in this country of a new system of mixing.

This system, known as the Colprovia impact method, sprays the hot asphalt on the aggregates under high pressure (300 p.s.i.), resulting in a better coating and a more homogenous mixture, as the fine spray thoroughly coats even the smallest particles. The more even distribution of the bitumen also results in a reduction of the amount required. These mixes are also made at a temperature about 100 deg. less than with other methods, improving workability and eliminating any danger of overheating the bitumen. All four plant mixers have been equipped to use this method in addition to their original conventional installations. (Steam dispersion is also installed on two mixers.)

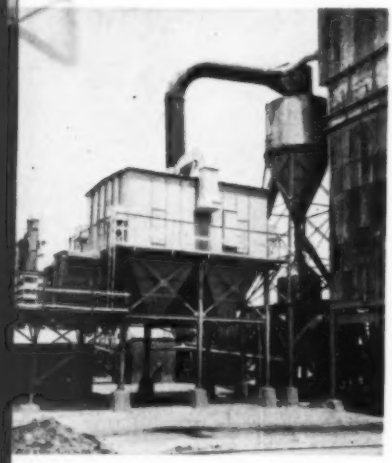
The Colprovia impact method was originally a European development, having first been used there commercially in 1939. Dr. Albert Sommer, the inventor of this process and president of Impact Mixing Corporation, came to the United States just before World War II and joined up in 1948 with Asphalt Processes Corporation. The first installation in this country was made in one of Buffalo Crushed Stone's plants in 1949, and the others followed.

The system is being marketed as a joint venture of Colprovia Roads, Inc., and Asphalt Processes, Inc., of New York City. Adrian Talbot, well-known authority on asphalt paving mixtures, is president of the new corporation, which is holder of the patent rights in the United States and Canada.

The Buffalo Crushed Stone Corp. used some of the first asphalt produced with the impact method for access driveways into the plants from highways, a total of about ½



• A general view of the Buffalo Crushed Stone Corporation's facilities at Bowmansville, N. Y., with Plant No. 3 in the foreground, Plant No. 1 in the background, and a part of the crushed stone plant at the left.



• Left: The 25,000-c.f.m. dust collector connected to Plant No. 1 with the centrifugal separator at the right.
• Right: Another view of the dust collector installation at Plant No. 1, showing the drier at the left.

mi. As an experiment, eight different mixes were used.

The three black-top plants of this company are located adjacent to and are operated in conjunction with the crushed-stone plant, which has a daily productive capacity in excess of 3,000 tons.

The black-top plants are grouped in a semi-circular arrangement around a central line of bins, to which the aggregates are dumped from trucks at grade. One section of these bins delivers to either or both of two parallel belt conveyors, which supply the feed elevators for Plants 1 and 2, permitting a regulated feed of any desired composition. Another section of the divided bins serves Plant 3 through plate feeders and an inclined belt conveyor.

Cars of asphalt and fuel oil are received on an adjacent track of the West Shore Branch of N.Y.C.R.R., and suitable tanks are provided for storage. Steam for heating purposes is provided from a central plant, equipped with a modern, automatically-controlled steam generator, arranged for alternate use of oil or natural gas as fuel.

The dryer at Plant No. 1, manufactured by McCarter Iron Works, is of the tandem type, with drum sizes 5 ft. 5 in. in dia. by 21 ft. long and 6 ft. 10 in. in dia. by 22 ft. long. Each drum has a combustion chamber for oil firing, and the exhaust outlet is at the transfer point between the two drums.

Dried products may be delivered alternately to two 14-in. by 7-in. bucket elevators. One of these serves only the screen above the mixing plant bins. The other is arranged to deliver to a 17-ft. dia. by 40-ft. high sand storage silo and may also be used to reclaim sand from this silo for the mixing plant. Distribution to the mixing plant bins is accomplished through a 4- by 16-ft. Seco vibrating screen, with four decks.

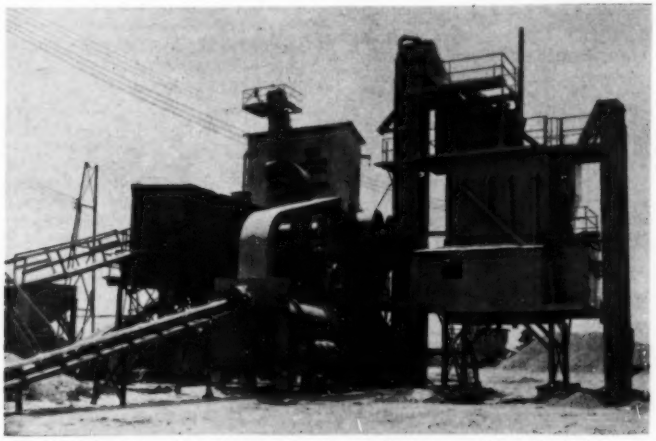
Two batching plants and mixers of 5,000-lb. capacity each (McCarter Iron Works) are entirely independent and may be used, if desired, to produce two different classes of products. This plant is also directly served by a 60-hp. hammermill for grinding hard asphalt for the production of Colprovia mixtures.

The Sly dust control system is designed to handle a maximum exhaust volume of 20,000 c.f.m. at 400 deg. F. from the dryer and 5,000 c.f.m. additional from the screen housing and fines bins. The exhaust from the dryer is passed first through a 10-ft. dia. centrifugal separator to scalp out the coarser dust particles. This separator is so arranged that the collected product may be returned to either elevator for use in the mix or delivered to a 10-ton bin for disposal.

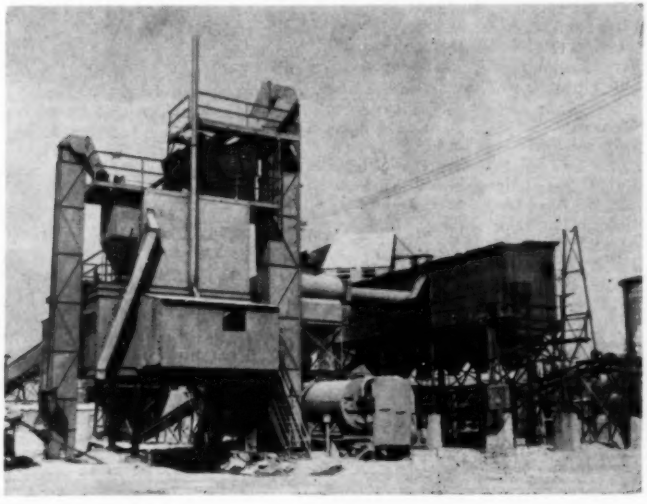
The fine dust particles are separated from the exhaust air in a Sly dust filter. This unit is 20 ft. long by 17 ft. wide and contains a total of 10,300 sq. ft. of cotton filter cloth in four compartments, each provided with a hopper of about six tons' capacity. The filter is supported with a clear height of 10 ft. under the hoppers, which are equipped with 12-ft. lever-operated slide gates.

The temperature in the dust filter is automatically regulated within suitable limits to avoid low temperatures, which would tend to produce condensation, and to keep below 200 deg. F., which is considered the safe high limit for cotton fabrics. This is accomplished by the use of thermostatically-controlled dampers, operated by compressed air. One damper admits atmospheric air to the filter case as needed for cooling. Another damper, located on the fan discharge, regulates the fan capacity to accommodate the full exhaust from the dryer and screen, plus the required volume of cooling air. Under maximum conditions, the fan is capable of handling 46,000 c.f.m. at 200 deg. F. This fan, located on the clean-air side of the filter, is operated by a 100-hp. motor.

Automatic - continuous operation



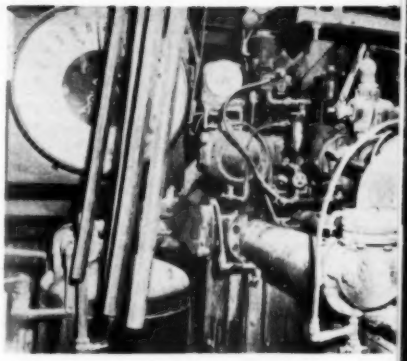
• Plant No. 3, with the dust collector at the left, and Plant No. 2 visible in the background.



• Another view of Plant No. 3, showing the dust collector and the drier. The crushed stone plant is in the background.

• Left: One of the impact mixer installations, which sprays hot asphalt on the aggregates under high pressure.

• Right: The batcher, the scale, and other equipment in one of the plants.



of the dust filter, with minimum fluctuation in suction and air volume, is secured by a system of motor-operated dampers in the clean-air ducts between dust filter and exhaust fan. These dampers, controlled through a program timer, periodically close off each compartment of the filter for a few minutes and cause a reverse air flow through the cloth while it is being agitated to shake the accumulated dust down into the hopper.

This plant is used for a wide range of hot-mix and cold-mix specifications. The tonnage of dust collected will vary with the nature of the aggregate being processed. Average collection for a day's run of 1,000 tons is about 10 tons in the cyclone separator and 20 tons in the Sly dust filter. The cyclone product averages about 40 percent through 200-mesh screen and 70 percent through 40-mesh. Material collected in the Sly filter averages 75 percent through 200-mesh screen and 98 percent through 80-mesh and is used as mineral filler in certain sheet asphalt specifications. This installation was in use throughout the 1950 season.

The dryer for Plant No. 2 is 5 ft. in dia. by 30 ft. long, with combustion chambers at both ends for oil firing. It is arranged with exhaust connection at the center of the drum. A 14- by 7-in. bucket elevator delivers to a 5- by 10-ft. screen over mixing-plant bins. The batching and mixing plant of 5,000-lb. capacity was made by Hetherington & Berner. Dryer, screen and mixer are exhausted through a wet separator, with fan operated by a 50-hp. motor. A large settling basin is used to partially clarify the effluent, and the collected fines are recovered from this basin by a clamshell bucket. This plant operates principally on hot mix and sheet asphalt specifications.

The dryer at Plant No. 3 is 6 ft. in dia. by 30 ft. long, Hetherington & Berner counterflow type, and is fired with two oil burners in a combustion chamber at the discharge end. Aggregate is elevated to a fully-enclosed 5- by 12-ft. screen over the mixing-plant bins. This plant is equipped with a separate elevator for mineral filler. The Hetherington & Berner batching and mixing plant is of 5,000-lb. capacity.

Provision is made for a maximum dryer exhaust of 16,500 c.f.m. at 275 deg. F. This exhaust is passed first through a primary separator of the horizontal skimmer type, which delivers its collected product into the hot elevator. This is followed by a Sly dust filter of the automatic-continuous type, equipped with temperature control, as described above for Plant No. 1. The Sly filter in this case contains 9,000 sq. ft. of cloth and is arranged in two compartments, separated by a large classifier chamber. The size of the Sly unit is 36 ft. long by 8 ft. wide, with steel supports spread for passage of trucks below. The exhaust fan is operated by a 75-hp. motor.

The original Sly installation for this plant was made in 1940, with certain improvements added at a later date to permit use on the full range of hot and cold mixes.

Ideal's Expansion at Ada

(*From page* 76)

the finish mill will include the construction of an outdoor concrete load center which will house starting equipment for most of the new units.

Power Prior to the expansion program the plant operated most of the time on its own power, utilizing two waste heat boilers connected to the three original kilns, and a gas-fired boiler installed in 1949. These units provide steam for a 5,000-kw. Allis-Chalmers turbine and for a 3,000-kw. General Electric turbine. Operation of the new kiln, the additional mills for raw and finish grinding, and the various units of auxiliary equipment will necessitate the purchase of additional power from the local utility company.

Total employment at Ada, including the quarry and all departments of the mill, comes to about 300. Key members of the local staff include Gayle Davis, plant manager, Glenn T. Horlbeck, assistant plant manager, George Kuras, plant engineer, and Albert Russell, chief chemist.

General Information The plant at Ada is one of ten plants operated by Ideal. Other installations are located at Mobile, Ala.; Okay, Ark.; Boettcher, Colo.; Portland, Colo.; Hanover, Mont.; Trident, Mont.; Superior, Neb.; Houston, Tex.; and Devil's Slide, Utah. An additional plant is being built at Baton Rouge, La.

General Offices of the Ideal Cement Company are located in Denver, Colo. C. K. Boettcher is president, Cris Dobbins, executive vice-president and general manager (both of Denver), and M. O. Matthews, vice-president and general manager, Southern Division, with headquarters at Ada.

Fast Limestone Production

(*From page* 79)

return chute allows the loading of trucks when stone larger than 1½-in. is demanded. Three 23-cu. yd. bins load trucks by gravity feed.

A Madison-Kipp Model 50 Lubricator, a drip oiler operated by a small electric pump that gives a constant uniform supply of oil to all screen bearings, operates whenever the screen is running. Oil supplied by a small one-day tank with sight feed feeds all four bearings. Excess oil passes through the oil seals as waste.

A 24-in. by 60-ft. portable conveyor with a hydraulic hoist is used for stockpiling agricultural limestone, and road material is stockpiled by trucks. Both are reclaimed by a Haiss pathdigging loader. Road materials are stockpiled by a contract hauler, and all deliveries are handled in the same way.

Productive Maintenance— A Program for Industrial Mobilization

By **H. F. McCULLOUGH**
Manager, Service Shop Division
and
H. D. BEALE
Manager, Renewal Parts Division
General Electric Co., Schenectady, N. Y.

THE times are putting American industry to the test with the double-barreled job of production for defense rearmament and production to meet unprecedented civilian needs. They ask the seemingly impossible—more production, when capacity has already been reached.

The possibilities for expansion which were present in 1940, when the nation began arming for the second world war, do not exist today. At present, employment is virtually at its peak, and with the armed services requiring additional thousands of young men and women, there are likely to be fewer people, rather than more, to man the industrial front. Without additional employees, plant expansion is meaningless; and, for an additional complicating factor, capital equipment is increasingly hard to obtain.

With the need becoming greater every day, the nation's industries must seek new ways of using what they already have to create extra production. Manufacturers must get the most from every machine in the shop, using it to its fullest potential; and they must employ every means at their command to remove existing barriers to achieving maximum production.

One of these means is the establishment of an effective maintenance program to keep equipment performing as it was designed to perform—and, in effect, more efficiently than it has performed before. Management has in many cases paid lip service to the importance of the job being done by the maintenance man in helping to keep equipment in good working order; but too often the job of maintenance is looked upon as a necessary evil—something to be done only when the occasion arises.

• Shown reviewing the kit designed to aid in setting up a productive maintenance program are H. D. Beale (left), manager of G. E.'s Renewal Parts Division, and H. F. McCullough, manager of the firm's Service Shop Division. The kit is a file-size package consisting of an instruction bulletin, a typical balance sheet for keeping historical data on each machine, planned outage forms, and check lists for motors, control, and other equipment.

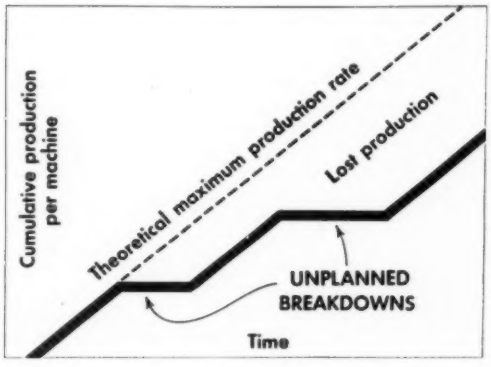
This negative attitude has failed to recognize the positive productive potential in good maintenance. Properly handled, maintenance can be a constructive factor in increasing productive output, and viewed in this way it takes on new significance as an answer to the nation's industrial mobilization needs. More important than routine preventive maintenance, it becomes truly *productive* maintenance, capable of creating added output without additional machines.

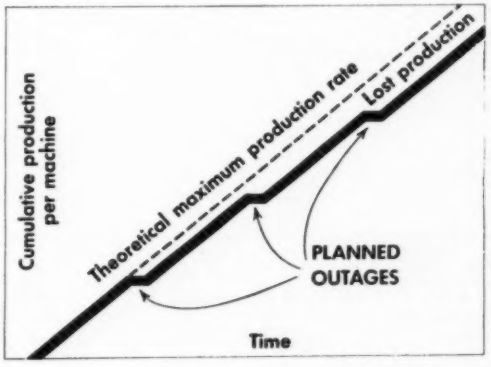
Believing that productive maintenance offers management a new tool for extending production capacity beyond existing limits — not just keeping those limits as they stand— the General Electric Company has developed a productive maintenance program which can be applied to virtually every type of industry in the country. This program, calling for a thorough and systematized approach to the whole idea of maintenance as a positive rather than a negative force, has the inherent ability to help meet the nation's needs for full industrial mobilization.

As a new concept applied to industrial operations, productive maintenance strives to give the greatest possible aid to the plant as a whole, so that it may achieve a level of production as close to the theoretical maximum as possible. Through farsighted, long-range planning, productive maintenance anticipates the problems of unwanted production breakdowns and acts to minimize the probability of their happening. This is an approach to maintenance which no longer regards the matter as the step-child of production, but rather as a force which can work hand in hand *with* production.

An effective productive maintenance program consists of

(1) an *adequate staff* of trained maintenance men, armed with
(2) the *tools* needed to perform properly the functions of
(3) *regular, routine checks* of





• These charts illustrate how production maintenance can increase production by cutting lost production due to unscheduled equipment outage.

operating equipment, and

(4) *planned outage* of this equipment at regular scheduled intervals. Rebuilding and modernizing machines during the time of planned outage is done readily with parts from

(5) *an adequate stock of mechanical and electrical spare parts.*

Management must provide for an adequate staff of trained maintenance men, must make available a budget sufficient to face up to the facts of the situation, and must provide tools and instruments as modern and functional as those supplied to production crews.

With the necessary men, tools, and money, productive maintenance is ready to go to work. Since the goal is to get the most out of the machines in the plant, it is necessary to know the worth of every machine *to* the plant, how it is expected to perform, and how much attention it demands from the maintenance man. For this purpose, a card index system, recording brief biographies of every piece of equipment, is kept for handy reference.

The card index system is an invaluable aid in the day-to-day, routine maintenance measures that are, of course, a vital part of the productive maintenance program. The machine biographies guide workers in carrying out preventive maintenance projects, such as periodic inspections, routine cleaning, bearing maintenance, varnish treatments, oiling and the like. Such preventive measures are common enough in most companies. In a productive maintenance program, however, they are conducted under a fixed plan. With the card index as the record of past procedures, a definite schedule for handling preventive problems can be readily worked out and adhered to, with the minimum of time and effort.

Important as the preventive activities are, they can merely *prevent* machines from doing less than they usually do. The aim of productive maintenance, however, is *added* production, surpassing the limits of output already achieved. This means, in effect, getting machines to work more efficiently. Since the equipment already is scheduled for use to the fullest extent, extra output can be gained only by minimizing their normal time-out from scheduled use for major repairs and overhauling.

Here is the heart of the productive maintenance idea—to overcome, as far as possible, all unscheduled breakdowns of equipment causing delays in production, often when they are least expected or can least be tolerated. By providing for a system of planned outages—planned in advance for the time when the machines can be taken out of service for the shortest possible time—the stoppage will least affect total output and other operating units in the plant.

Everyone knows the pitfalls of unscheduled breakdowns. Primarily, they mean the loss of production—the loss of vital units coming off the line hour by hour—which can never be regained under today's conditions of around-the-clock operation. In the integrated plant, where one operation depends closely upon many others, a whole production line can be shut down by the failure of one critical unit.

Other serious consequences can result from unplanned shutdowns, not the least of which is the cost of labor involved. To gain speed in repairing the broken machine, maintenance crews must often work overtime at overtime pay. They are frequently hampered in their work by shortages of materials and replacement parts—both of which serve to prolong the delay and lower output.

Done as rapidly as possible, unscheduled repair work still means lost man-hours. Production men are forced to stand around idle. In situations where layoffs are necessary, the company risks the permanent loss of employees. When this happens, the company, after the repaired machine is back in operation, may be forced to hire new employees who must be trained; and this training in turn means lessened productivity. All in all, the unscheduled breakdown causes labor, time, and money losses—which can be avoided through the planned outage phase of a productive maintenance program.

The planned outage is designed to replace, as far as possible, the unscheduled breakdown by taking the machine briefly out of service for a thorough, time- and production-saving repair job before it reaches the point where it might break down of its own accord. To do this effectively, a complete, systematic survey of the plant and how it operates, the equipment, and the role of each machine in relation to the other, is first conducted. Broad in scope, the survey thus analyzes the entire operation of the plant. It also determines which equipment is the most critical, which carries the heaviest loads. Such a survey lists machines and units in the order of their vulnerability, noting the condition of each—its age, state of repair, severity of duty, and similar factors determining the desirability of additional repair and the kind of maintenance required. On the basis of this survey, recommendations can be made for a sound, overall planned outage program, and the means can be devised for handling it with the minimum of interruptions to the normal production schedule.

Since productive maintenance is a long-range, continuing program, not everything can be done at one time. The program is realistic and economical in operation, designed to tackle first things first. Even if the firm had the money to perform every necessary maintenance job at once, this practice would be self-defeating in stopping production altogether.

The equipment survey in the productive maintenance program serves to remove the guesswork from maintenance. Because of the total picture furnished by such a survey, other important improvements can be made at the time of the planned stoppage, improvements that might have necessitated stoppages of their own, were they allowed to wait unattended.

Included as an important part of the equipment survey is the recommendation it gives for stocking an adequate supply of needed renewal parts. By being able to look far enough ahead, by preplanning the replacement parts aspects of maintenance, the problems of delivery delays and temporary unavailability can be largely overcome. This foresight, too, can pay off in terms of less repair-time delay and consequent added production.

The need for increased production throughout industry is great; and setting up a far-reaching productive maintenance program to achieve that added output should not wait. Recognizing this fact, the General Electric Company has taken active steps to help maintenance men make management aware of the true value of productive maintenance. G-E has provided a kit of tools, a series of aids supplying the facts and guidance to carry out their own productive maintenance program and to convince their management of its necessity for industrial mobilization.

Productive maintenance is for all branches of industry, and for every kind of equipment. It provides a means for creating that extra measure of production so critically needed today and tomorrow for the industrial and economic health of the nation.

A World-Wide Review of the Portland Cement Industry

PART IV — ASIA AND THE NEAR EAST (Continued)
INDIA, PAKISTAN, AND NEPAL

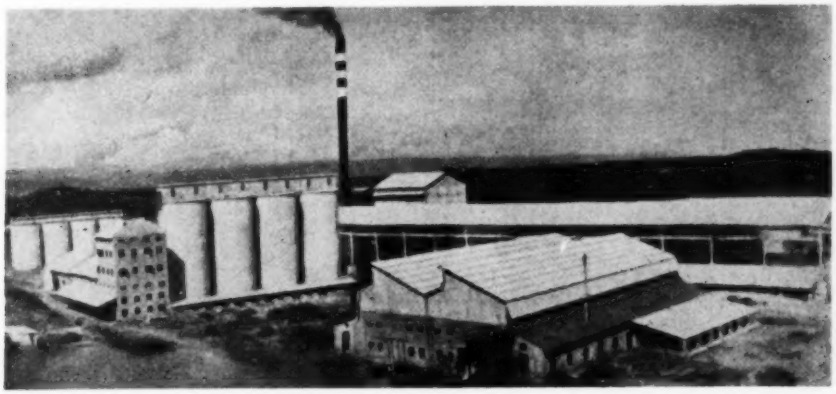
Dalmia The Dalmia Cement Company, Ltd., now has five plants in operation, four of which are in process of expansion. The 70,000-ton dry-process plant at *Dandot*, West Punjab, Pakistan, is being tripled in size and converted to the wet process. The *Drigh Road* plant at Sind, Pakistan, a 200,000-ton dry-process plant, is getting a 150,000-ton wet-process addition. The new *Dalmia Dadri* plant in Jind State is a 70,000-ton dry-process operation. The *Dalmia Nagar* plant is being increased from 150,000 to 300,000 tons capacity. The *Dalmia-purom* plant in Madras Province, a 70,000-ton dry-process operation, is getting a 150,000-ton wet-process addition.

United Provinces Government Cement Works The Government of the United Provinces of India late in 1949 let a contract to Vickers-Armstrongs, Ltd., London, for a 2-kiln wet-process cement plant with a capacity of 700 tons daily. Vickers is also acting as main contractor for all electrical work, motors, etc.; and the structural work, conveyors, etc., are being manufactured by associated companies. Limestone and shale are crushed in the quarry in two stages, through a 60- by 48-in. jaw crusher and a hammer-type crusher. A ropeway connects the quarry to the plant. Raw grinding is done in two 10- by 18-ft. tube mills operating in closed circuit with two Dorr 12- by 30-ft. classifiers. The slurry then goes to a Dorr thickener. Air agitation is used in all slurry tanks. The two rotary kilns are 14½-, 10- and 11½-ft. by 300-ft. and are equipped with Dessicators. Their estimated capacity is 14.6 tons per hour with a fuel consumption of 1,596 kg. calories per kg. of clinker. Two Size 633 Fuller inclined-grate clinker coolers are to be used. Two 7½- by 10-ft. 2-compartment air-swept coal mills will grind and dry the coal in one operation. Finish grinding will be done in two 9- by 24-ft. 2-compartment mills operating in closed circuit. These will each have an estimated output of 22 tons per hour of cement when grinding to 5 percent residue on a 170-square mesh sieve. Fuller-Kinyon pumps will carry the cement to storage silos. Provision is being made for both bag and bulk loading.

Assam Bengal Cement Company The Assam Bengal Cement Company, Ltd., of Calcutta, India, an independent company, was incorporated in 1947 to establish a cement plant at Chhatak, Dt. Sylhet, East Bengal, Pakistan. This operation is a Polysius plant with a capacity of 250 tons per day. The limestone quarry is about 10 miles from the plant and is connected by a monocable ropeway. Power is generated by a 2,400-kw. turbine and a 600-kw. auxiliary set.

As the capacity of this plant is now inadequate to meet the growing demand in East Bengal (Pakistan) the company was requested by the Ministry of Industry and Education, Government of Pakistan, Karachi, to build an additional plant. As a result, an order was placed with F. L. Smidth & Co., Copenhagen, Denmark, for a complete 300-ton wet-process plant. Installments of this equipment was expected to begin arriving in the early part of 1951.

Equipment ordered for the crushing department includes a laminated rock conveyor, a swinghammer crusher and a steel band conveyor. In the raw mill department there will be a Unidan mill with a table feeder, centrifugal slurry pumps, eight slurry silos with air agitation, and a 25-m. dia. slurry basin with mechanical agitation. A shaker conveyor will carry the clinker from the kiln to storage. Coal will be dried and ground in a Tirax mill, and finish grinding will be done by means of another Unidan mill and table feeder. The additional power needed will be supplied by a boiler and a 4,500-kilowatt turbine.

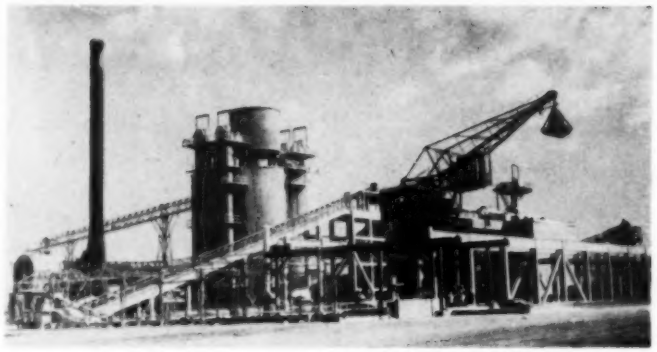


• Assam Bengal Cement Company, Ltd., Chhatak, Pakistan. Workshop is in foreground.

India Cements Limited The new plant of the independent India Cements, Limited, which went into operation in the summer of 1949 is located in the Tirunelveli District. It is a wet-process plant with a capacity of 350 tons daily and the equipment for it was supplied by F. L. Smidth & Co.

The deposit of fine crystalline metamorphic limestone is located about a mile from the plant and is connected to it by a newly-laid road. Climax compressors and drills are used in the quarry, and blasting is carried on with Gelignite and electric detonators. There is also an extensive deposit of clay. Both materials are hauled to the plant in Athey PD10 rubber-tired trailers hauled by Caterpillar DW10 tractors. The primary crusher is a swing-hammer mill. The product is carried on rubber and steel band belt conveyors to the 3-compartment Unidan mill for raw grinding. This is driven by an 1,100-hp. motor. The slurry is corrected in four silos and is stored in a 2,000-ton-capacity cylindrical slurry basin equipped with a revolving mechanical and air agitator. The Unax kiln is equipped for both coal and oil firing and has a capacity of 350 tons daily. A drag chain conveyor carries the clinker from the attached coolers to the storage yard.

The yard is open and the raw materials, coal, clinker, etc., stored there are handled by an 8-ton traveling revolving crane running on rails on top of a concrete runway. The clinker is ground in a 2-compartment Unidan mill which operates in closed circuit with separators above both chambers. A Smidth Fluxo pump carries the cement to storage. A valve bag packer was recently installed.



• A general view of the new India Cements Ltd. plant, with storage yard at right.

Independent Plants Other independent plants include the *Andhra Cement Company* at Bezwada, Madras Province, a 30,000-ton plant which is being expanded by 60,000 tons; the *Mysore Iron and Steel Works* at Bhodravati, Mysore State, a 20,000-ton plant being expanded by 30,000 tons: the *Kalyanpur Lime and Cement Company* at Bihar, a 40,000-ton plant; and the *Sone Valley Cement Company* of Calcutta, with a 200,000-ton plant in Bihar.

Projected plants authorized by the Government of India and their planned annual capacities include the following: *Travancore Cements Ltd.*, Travancore State (50,000 tons); *National Cement Mines and Industries Ltd.*, Ranchi (100,000 tons); *New Hindustan Cements Ltd.*, Bombay (100,000 tons); *Punjab Minerals Ltd.*, Dandot Area, West Punjab, Pakistan (100,000 tons); *Digvijay Cement Co. Ltd.*, Jamnagar (100,000 tons).

Nepal In 1949 the Allis-Chalmers Mfg. Co. supplied equipment for a 200-metric ton, 1-kiln wet-process plant to be built at Kathmandoo, Nepal. This included an 8½- by 8½- by 300-ft. rotary kiln.

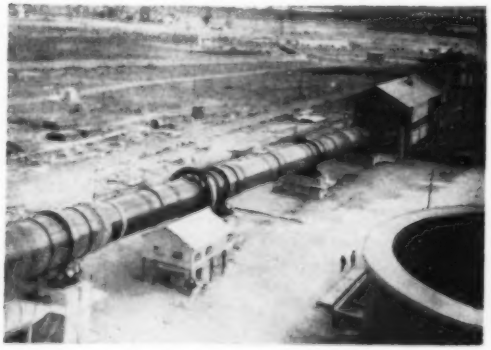
AFGHANISTAN

The construction of a cement plant has a prominent position in Afghanistan's economic development program, according to recent reports. A plan for its construction has been submitted to the Export-Import Bank for its consideration, and bids have been received from several European and American companies for the equipment. At present the annual requirement of about 20,000 metric tons has been imported from Pakistan.

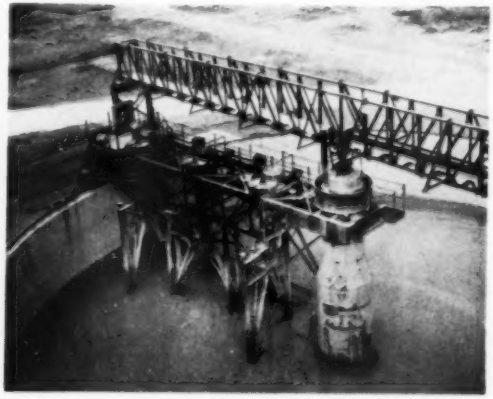
BURMA

The only cement plant in Burma is the one at Thayetmyo operated by the *Burma Cement Co., Ltd.*, a subsidiary of Steel Brothers and Co. Ltd. This plant produced more than 90 percent of that country's requirements before the war. This plant was severely damaged during World

• The 350-ton-per-day kiln at the India Cements Ltd. plant, with attached cooler at right.



• The revolving mechanical and air agitator in the 2,000-ton slurry basin.



War II, and reconstruction was started in 1946. Shipments were started again near the end of 1948, but in March, 1950, the Communists seized the area, "nationalized" the works, and expelled the staff.

CEYLON

Late in 1945 it was proposed to build a cement plant at Kankesanturai on the northern Jaffna peninsula of Ceylon as part of a program for increasing the industrialization of that country. In the latter part of 1946 this 100,000-bbl. plant was well under way, and it was proposed that a private company be formed to operate it. This plan was rejected. This plant was finally completed as a government project and officially went into operation September 21, 1950. In the meantime the demand for cement in Ceylon was steadily increasing.

Vickers-Armstrongs Ltd., supplied most of the equipment for this new dry-process plant which has a capacity of 110,000 tons annually. The limestone is reduced by a jaw crusher followed by a hammermill; the clay is cut into ribbons, which are fed to separate rotary driers and to a compound mill. The ground meal is carried by Fuller-Kinyon pump to storage silos. A second Fuller-Kinyon pump and automatic valves are used for circulating and blending the meal, the same pump also being used to feed the raw mix to the kiln hopper. There is a special feeding arrangement and preheater, with the kiln exhaust gases passing through internal tubes positioned inside the enlarged feed zone of the kiln. The kiln is 2.9, 3.2 and 4.34 m. in dia. and 77.7 m. long and has a capacity of 12.5 tons per hr. It is oil-fired, and the clinker is discharged into a Fuller air-quenching cooler before going to storage. Finish grinding is done in a 4-compartment mill 2.29 m. in dia. by 12.19 m. long. The finished cement is pumped to silos by another Fuller-Kinyon pump.

CHINA

The status of the cement industry in China is hidden behind the "iron curtain," but it is believed that most of the equipment from plants in China, including Manchuria, has been sent to Russia. In 1948 it was reported that cement production in China was increasing steadily. The output of the National Resources Commission, which was 40 percent of the total production of cement in China, was 243,477 metric tons in 1947. This made the total output of that country in 1947 about 600,000 metric tons.

When the "curtain" fell on Manchuria and Mongolia, there were ten plants, mostly 2-kiln operations, with a combined capacity of about 2,000,000 metric tons annually. The Japanese *Onoda Cement Co.* operated six of these, the first one at Darien having been built about 1908.

FORMOSA

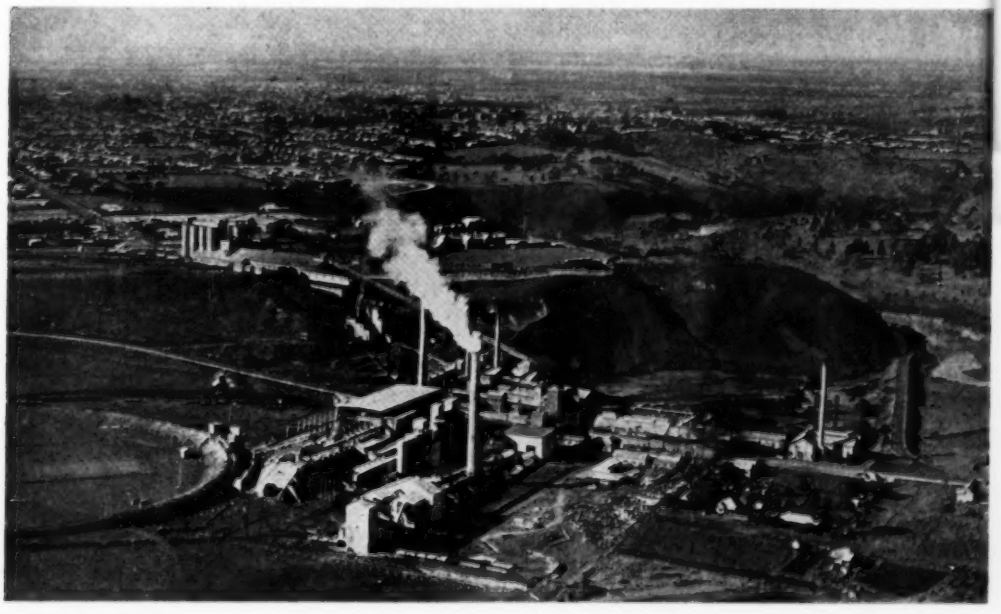
Little recent information is available on the cement industry on the island of Formosa, but it is known that the three cement plants in that last stronghold of the Chinese Nationalists have a combined capacity of nearly 700,000 metric tons annually. Two of these plants in 1943, under Japanese domination, produced 293,780 tons. The third plant, at Chikuto in the northwest part of the island, was almost completed when the island was liberated and is now believed to be in full operation.

FRENCH INDOCHINA

Cement production in French Indochina in 1949 was 153,069 metric tons, nearly double that of 1948, in spite of shortages of raw materials and some production delays. It is expected that 190,000 tons will be produced in 1950. The only plant in Indochina is that of the *Societe des Ciment Portland Artificiels de l'Indochine* at Haiphong. Before World War II the capacity of this plant was 300,000 metric tons annually, and this was raised to 400,000 tons under Japanese rule. The plant was damaged seriously in air raids and has been repaired only partly.

IRAN

In an effort to overcome the natural as well as man-made handicaps



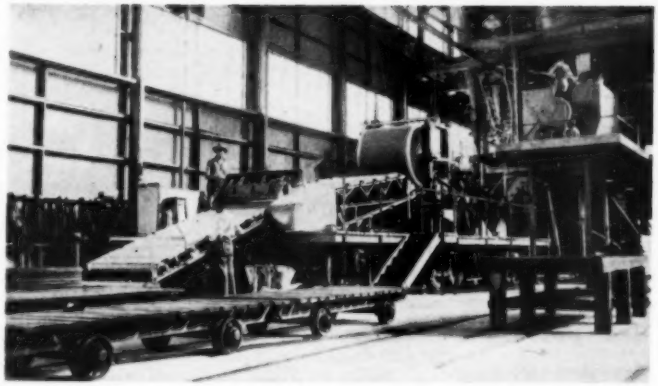
• A panoramic view of the Australian Cement Ltd. plant at Fyansford, Geelong, Victoria.

of soil and economics of Iran, far-sighted Iranians headed by the Shah have instituted a Seven Year Program of industrial and land improvement. In addition to planning for the impounding and control of waters for irrigation, the program looks forward to the betterment of Iran's industry and transportation and to the efficient exploitation of the country's natural resources.

Among the early projects of the program will be the improvement of Iran's one cement plant, located in the capital city, Teheran, and the erection of several other cement plants at suitable locations. This augmented production is considered necessary to meet the building requirements contemplated by the Plan.

A comparison of annual cement consumption per capita among the Middle Eastern countries places Iran at the bottom of the list of the cement producing countries, so it is immediately apparent that increased production is necessary for a nation-wide improvement program. Of the cement consumed over recent years in Iran, 47 percent was imported, with resulting high prices. These range anywhere from $12 to $16 per barrel, to which must be added high transportation rates. This has priced cement beyond use for ordinary construction.

Rey Plant This plant, located in Teheran, uses the dry process and is rated at 300 metric tons (1,740 barrels) daily production. The original installation (completed in 1933) had a capacity of 100 tons daily. A second unit completed in 1937 was intended to bring the total plant production to 300 tons. Both installations were of European equipment. With the advent of World War II and the resulting shortage of operating and repair supplies, plant efficiency soon dropped to a daily production which seldom exceeds 180 tons.



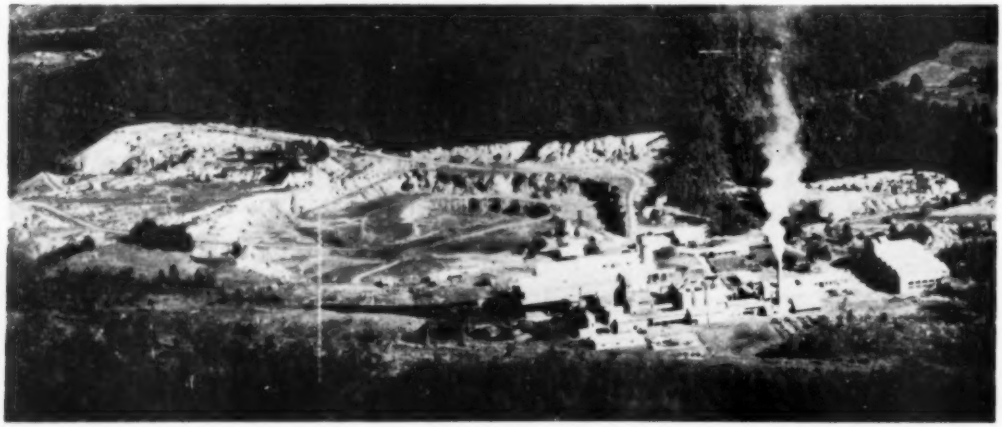
• The asbestos cement machine in a plant adjoining the cement plant of the Goliath Portland Cement Co. Ltd., at Railton, Tasmania.

Further reducing plant efficiency is an uncertain fuel supply, coal being low in quality and at times almost unobtainable. Fuel oil is used at such times, but only in an emergency. Rock is quarried and reduced to 12-in. size by hand, resulting not only in excessive raw materials cost, but frequently in reduced output of plant, due to lack of rock. Hand extraction of rock and poor materials-handling systems demands employment of much labor. This, combined with general inefficiency, places 1,200 men on the payroll. Not all of these workers, however, are employed in strictly cement-manufacturing activities, the actual worker roll being more nearly 750 men.

In 1939 contracts were let for equipment and buildings to increase the production of the plant an additional 300 tons or to a rated capacity of 600 tons daily. Although the buildings and preparatory field work were completed for this addition, the equipment, which was purchased in Europe, was impounded as a war emergency; so only a small part of the order was delivered to Iran.

Recently steps have been taken to deliver the remaining items of equipment and to replace those which were destroyed. Completion of this work and repair of present plant machinery should bring production of the Rey plant close to the 600 tons required.

Although over the years management of the Rey plant has been varied, it is currently controlled by the government, management stemming from the Plan Organization. This might be considered temporary and predicated on a final decision



• A general view of the Goliath facilities, showing the quarry and the plant, near Railton, Tasmania.

by the Plan in its promotion of cement as a basic need for the work of national improvement.

Shiraz Plant These facilities are now under development. There will be a 200-ton-per-day (1,180-barrel) dry-process plant having one kiln with waste-heat boiler and using fuel oil. Shiraz is the capital of the Province of Fars in the south central part of Iran, in an area where grain, cotton, citrus fruits, grapes, and sugar are grown. The founding company, known as the Shiraz Cement Company Ltd., was organized in 1948 by a group of land owners and industrialists of the Shiraz area. This company contracted for the major cement and power machinery with the Kennedy-Van Saun Manufacturing & Engineering Co. in 1948. Early this year the Fars Cement Company was formed with a capital of Rials 200,000,000 (about $6,100,000), in effect a merger of the founding company and the Plan Organization, the latter assuming the obligations under contract.

The major cement and power equipment is now in process of delivery although there yet remains much accessory equipment to be purchased.

Dorud Plant Now under consideration, this plant will probably be a wet-process unit, initially 200 tons daily capacity. Fuel oil will be burned and power will be supplied by the plant's own diesel generating units. Layout of plant is still to be agreed upon and currently no equipment has been purchased.

Dorud is in the southwestern part of Iran on the Iranian National Railway, an excellent position for the distribution of cement not only to the north but to the oil-producing areas of the south. With the advent of irrigation, the surrounding area will prove a fertile one. There is a year-round supply of water which will more than supply the needs of a wet-process plant.

The founding company is the Dorud Cement Company, organized by a group of Teheran business men who are contractors, engineers, and land-owners. Initial capital will approximate Rials 150,000,000 (about $4,600,000). Financing has not yet been completed.

The rehabilitation of the Rey plant, together with the building of the Shiraz and Dorud plants, will require an expenditure approximating $11,000,000 in Iran for cement manufacturing and should result in 300,000 metric tons of annual production, reducing the cost of cement by half.

IRAQ

The *Iraq Cement Company, Ltd.*, in November, 1949, put into operation the first and only cement-producing plant in that country, near Baghdad. Annual output is about 75,000 metric tons, and it is expected that steps will soon be taken to double this figure. This cement is marketed domestically under the trade name "Arab horse tied to a palm tree." In 1946 the Iraq Building Material Co., Ltd., was planning a plant with a capacity of 300 metric tons daily, but this apparently has not materialized.

ISRAEL

The vast increase in the population of Israel, nearly doubling in the last three years, has created a phenomenal increase in the demand for portland cement. Total sales of cement produced in Israel in 1950 were 380,000 metric tons, as compared with 260,000 tons in 1949 and 141,396 tons in 1948. In spite of this increase, 82,000 tons of portland cement had to be imported in 1950, indicating a total consumption of 462,000 tons. It is believed that 750,000 tons could have been used if this amount had been available. The capacity of the one existing plant was expanded materially, and two new plants are planned for early construction but even when these are completed the capacity is expected to be far below the demand.

The *Palestine Portland Cement Works, Ltd.*, formerly known as the Portland Cement Co. (Nesher) Ltd., was founded in 1923. It now has two wet-process rotary kilns, one of which was installed in 1950, and six shaft kilns. It is planned to further enlarge the plant to attain a capacity of 500,000 tons annually. The company also plans to build a branch plant at Ramle, near Tel Aviv, which is expected to begin production about the middle of 1952 with an annual output of about 175,000 tons.

A private company, known as *Shimshon Co., Ltd.*, has been organized to build a cement dry-process plant at Hartuv, midway between Tel Aviv and Jerusalem, with an annual capacity of 250,000 tons. The machinery and equipment for this plant are reported to be in Israel, and production is expected to start in 1952. Most of the equipment is being furnished by Vickers-Armstrongs Limited. It will include a 56- by 42-in. primary jaw crusher driven by a 175-hp. motor, a hammermill driven by a 175-hp. motor, an 8-ft.-wide traveling grate clay drier with a capacity of 13 t.p.h., a similar limestone drier with a capacity of 39 t.p.h., two 8- by 45-ft. raw-grinding compound tube mills driven by 1,100-hp. motors, two 10-, 11½-, and 16-ft. by 270-ft. rotary kilns, each equipped with Vickers-Armstrongs preheaters and driven by 120-hp. motors; and two 8- by 45-ft. finish-grinding compound tube mills designed for a capacity of 27 t.p.h., grinding to a fineness of 5 percent residue on a 4,900-sieve. These mills are also driven by 1,100-hp. motors.

KOREA

When hostilities broke out in Korea, there were six cement plants, one in South Korea and five in North Korea. Their combined capacity was about 1,570,000 metric tons annually. The *Onoda Cement Co.* of Japan built four of these plants, including the one in the South, which is near the 38th Parallel and is said to be an excellent operation. Of the other North Korean plants *Asano* built one and *Ube* the other. One of the North Korean plants is said to have a 150-meter rotary kiln; the others all have Lepols.

LEBANON

No information is available on the cement industry in Lebanon except that cement production in 1949 totaled 233,000 metric tons. Output in 1948 was 200,000 tons. This was a considerable increase over the 1941 low of 67,900 tons and the earlier 1937 high of 180,459 tons. The only producer is the *Societe des Ciments Libanais*, with a plant at Chikka in North Lebanon.

SAUDI ARABIA

Late in 1948 it was reported that the construction of a cement plant was being considered which would supply cement for ordinary construction as well as for oil wells. The output of 600 metric tons per day would just about meet the needs of that country.

SYRIA

The production of cement in Syria is on the increase. The 1949 output was 51,632 metric tons, 5 percent over the 1948 volume, and in 1950 it was expected to reach 65,000 tons as a result of plant additions under way. The only producing plant is that of *Societe Nationale pour la Fabrication du Ciment et des Materiaux de*

(*Continued on page* 105)

WASHINGTON NEWS LETTER

Real Estate Credit and the Volume of Construction

another ON THE SPOT report

BY AND large, the availability of real estate credit is the principal factor which determines how much — or how little — construction is going to take place. All industrial and practically all farm construction is financed for the most part by borrowings. Even for residential construction, a recent study of the Federal Reserve Board revealed that only about 15 percent of the homes sold were bought for cash.

Thus, the pit-and-quarry industries, whose prosperity is heavily dependent on the volume of construction, have a real stake in the availability of real estate credit. In that connection, two recent developments are of substantial importance.

The first of these goes in the direction of making real estate credit more available. In recently passed legislation, permission is given for the suspension of the very restrictive Regulation X in areas designated by the government as "critical defense areas." Also, other changes in this regulation are now being considered by Congress in connection with another bill. If this legislation passes, it will either suspend the regulation or substantially liberalize it for lower-priced houses.

The second development, however, goes in the opposite direction. It is Bulletin No. 4 of the Voluntary Credit Restraint Committee, which deals with loans on real estate. This committee was organized under the sponsorship of the Federal Reserve Board. It is composed of representatives from that Board and its member banks and of each of the principal types of lending institutions. Its purpose is to help fight inflation by recommending certain policies for credit restraint to these lending institutions. Although they are not required to follow these recommendations, nevertheless the committee recommendations carry substantial weight in determining their credit policies.

In connection with real estate credit, the Voluntary Credit Restraint Committee has made the following recommendations:

1. On loans on small residential property (one- to four-family units) the committee urged all financing institutions to continue to follow their conservative lending policies and in addition, "in no case to make a loan on existing property in an amount which would cause the *total amount of credit outstanding* (primary and all other credit combined) with respect to the property or with respect to the transaction to exceed the limits which Regulation X imposes as to new construction."

2. On loans on agricultural property, the committee recognized that in some instances these may be, in effect, loans on residential properties. Nevertheless, it feels that normally such loans fall in the category of loans on commercial property and should be guided by its recommendations on that subject.

3. On loans on large residential property (more than four-family units) and on commercial property, the committee recommended that they be "screened as to purpose and the loan should not be made unless it is in harmony with the principles of the (Voluntary Credit Restraint) Program. If the loan is to be made in connection with the sale of commercial or residential property, a determination by the financing institution that the sale and the sale price are *bona fide* may constitute a sufficient screening of the loan . . . ."

"Financing institutions are urged to limit a loan on any type of property described in this section, whether or not a sale is involved, to an amount which would not cause the *total amount of credit outstanding* with respect to the property or with respect to the transaction to exceed 66⅔ percent of the fair value of the property. Also the committee urges that financing institutions require an appropriate and substantial amortization of principal."

4. On industrial property, the committee recommended that loans "should be screened as to purpose whether or not the loan is made in connection with a sale of real property. In this instance, however, there appears to be no need for a percentage limitation on the amount of the loan since in the industrial field mortgage security usually is merely one of the factors considered by the lender in determining whether to make the loan and often bears comparatively little relationship to the amount of the loan."

5. On sale-lease back arrangements, the committee urged "financing institutions to recognize that in most instances a 'sale-lease back arrangement,' whereby real property is purchased by a financing institution and leased to a vendor or his nominee, is a substitute for a form of financing and therefore comes within the Program and should be screened as to purpose."

After balancing the forces, it still appears that, in the near future at least, real estate credit will be harder rather than easier to secure. However, there are forces at work which may result in the relaxing of real estate credit restraints in a year or so. The most important of these is the expectation that some kind of peace can be re-established in the world. This would ease many of the inflationary pressures, among them the pressure resulting from easy real estate credit.

Profits and Taxes

Figures are just becoming available on corporate profits during the first half of 1951, and they are interesting indeed. The statistics of the situation may be seen in the following table:

	Corporate Profits Before Taxes (Billion)	(Annual Rate) After Taxes (Billion)
1950—		
1st quarter	$29.2	$16.0
2nd quarter	37.5	20.6
3rd quarter	45.7	25.2
4th quarter	50.3	27.8
1951—		
1st quarter	51.8	23.3
2nd quarter (estimated)	48.5	22.0

Throughout 1950 profits both before and after taxes rose very rapidly. Even before the beginning of the Korean war, business had been recovering from the recession early in the year. The buying boom associated with that war pushed profits to very high levels in many industries.

Profits before taxes rose from an annual rate of $29,200,000,000 in the first quarter of 1951 to $50,300,000,000 in the last quarter; profits after taxes rose from an annual rate of $16,000,000,000 to $27,800,000,000. In both cases this amounted to about 73 percent.

In the first quarter of 1951, however, profits before taxes continued to rise to an annual rate of $51.8. Despite this rise, profits after taxes fell to $23.3. This reflects very clearly the effect of the new tax rate.

By the second quarter of 1951, a new trend showed up. Here, profits

(*Continued on page* 102)

ATLAS CONVEYOR SELECTS

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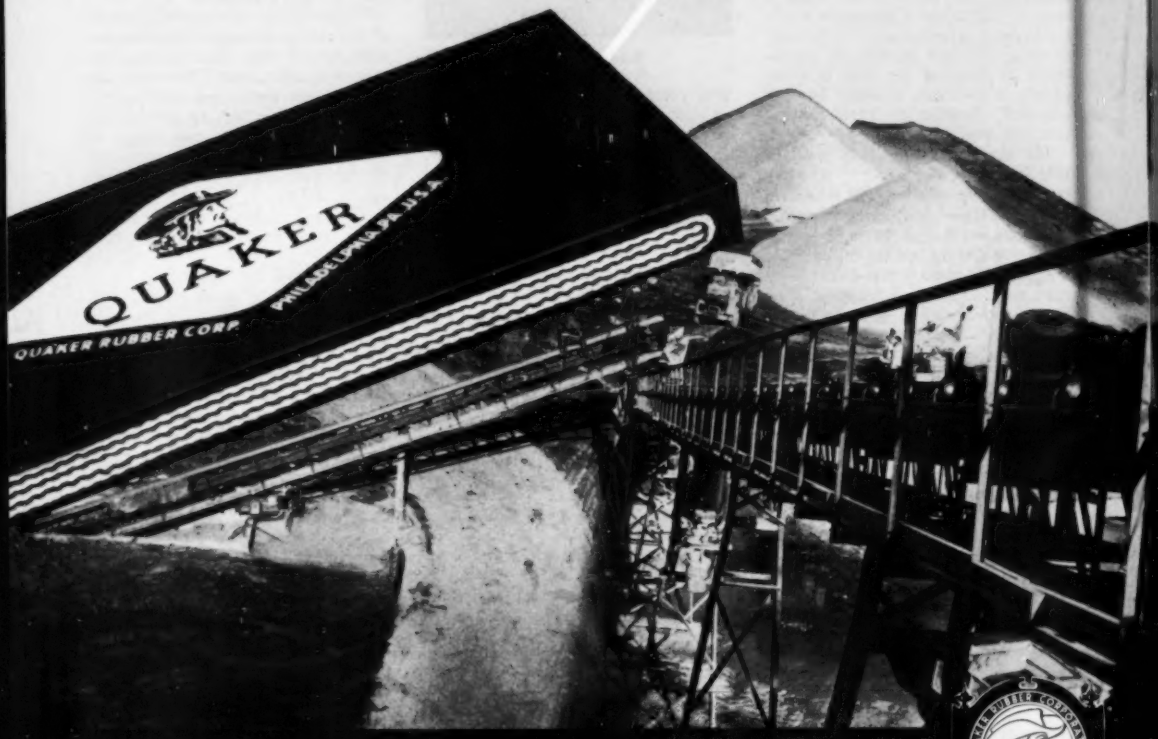

QUAKER RUBBER CORPORATION

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LAW OF GRADING AGGREGATES

By L. BOYD MERCER, M.C.E.

THIS publication presents in considerable detail the results of a carefully planned investigation conducted by the author at the University of Tasmania, Australia, and formed the basis for two papers which he recently presented, *The Law of Grading for Concrete Aggregates* at the Institution of Engineers, Australia, Conference in April, 1951, and *Gap Grading of Aggregates* at the Australia and New Zealand Association for Advancement of Science Congress, May, 1951.

The author suggested that an alternative title for his first paper could have been *Can Good Concrete Be Made from Badly Graded Sand and Stone?* and that provided the term "badly graded" merely meant those gradings which did not comply with the present generally accepted specification requirements, the question could be emphatically answered in the affirmative. He then proceeded to remove all mystery from the influence of aggregate grading upon concrete control by demonstrating that the grading is immaterial so long as the mix is completely compacted, whether by mechanical vibration or careful hand tamping and packing.

He suggested that an alternative title for his second paper could have been *How to Make Good Concrete from Badly Graded Sand and Stone*, again provided that the term "badly graded" merely meant failure to comply with some preconceived ideas and specification requirements. This paper was prefaced with the words, "All the king's horses and all the king's men" cannot reassemble the fragments of a crushed rock into the original solid or absolute volume. Yet this is little different from the aim of protagonists for "smooth" maximum-density grading curves. The obvious fact that minimum binder or paste will be required when an agglomerate consists of particles in which the voids of each size-group will be occupied by the next smaller size-group, has led to a general demand for continuous gradings. However, although a sieve analysis of aggregate particles

L. Boyd Mercer, M.C.E.

may present a grading which should at least theoretically, give maximum density, the coincidences of loose juxtaposition in conjunction with normal particle interference will prevent the individual pieces from reaching their allotted niches. Thus the fallacy of demanding continuous gradings should give way to the more practical considerations of discontinuous or gap gradings which present deficiencies in certain size-groups. He concluded by stating that he was, of course, aware of the natural apathy and opposition towards any proposed change from accepted principles. It was therefore with considerable surprise and pleasure that, subsequent to preparing the paper he had received a copy of an addendum to the economy memorandum, *Use of Cement in Engineering and Large-Scale Buildings*, of the Ministry of Works, England, which had just been published, recommending the use of "gap graded" aggregates as leading to savings of 13 percent of the cement.

Introduction to the Problem

Much time and money is being expended in selecting and using only those aggregates which conform with specifications requiring close and continuous grading limitations. A paper entitled *The Laws of Proportioning Concrete* by W. B. Fuller and S. E. Thompson, Vol. LIX, 1907, presented the parabolic curve of maximum density which became accepted as the ideal grading for concrete aggregates. Although the form of the curve was modified by Bolomey and others to provide for an increase in the percentage of fines, it has nevertheless remained the basis for acceptance of continuous gradings.

The position has now been reached where such gradings are demanded without full appreciation of the cost involved or the value to be gained through making such demands. It is undesirable to insist upon the adoption of continuous gradings within close limitations unless it has been established beyond doubt that such gradings are essential. Even provided that continued narrowing of grading limitations can result in better concrete where those limitations can be observed, there are very many less fortunate locations where such gradings cannot be economically ob-

We recently received in this office for review a copy of *The Law of Grading for Concrete Aggregates* by L. Boyd Mercer, M.C.E., chief engineer of Ready Mixed Concrete Limited, Melbourne, Australia. In this exhaustive treatise Mr. Mercer describes the manner in which he arrived at conclusions which have already aroused great interest among concrete technologists in Australia and elsewhere. His aim is "to remove all mystery from the influence of aggregate grading upon concrete control and by so doing to conserve material supplies and save wastage in labor and materials." He has done a remarkable job of original thinking and investigation, and we believe many of our readers will be interested in what he has to say.

The original treatise is far too long to be reprinted in these pages, and no ordinary review would do it justice. With this thought in mind, we asked Mr. Mercer to prepare for us a more detailed review and an abstract which would give our readers a clear picture of his conclusions, the manner of arriving at them, and some of the supporting data.

Mr. Mercer has long held high rank among concrete technologists the world over, having written numerous articles on the design and use of concrete which have been presented at technical meetings or published in leading technical journals. His first such article, *Sliding Form Work*, published in the January, 1933, issue of the *Journal of The American Concrete Institute*, Vol. IV, No. 5, was awarded the Leonard C. Wason Medal for the most meritorious paper. Recent issues of the *Journal* have contained articles by and about Mr. Mercer, and a further series on *Concrete Cracking* will be published within the next few months.—The Editor

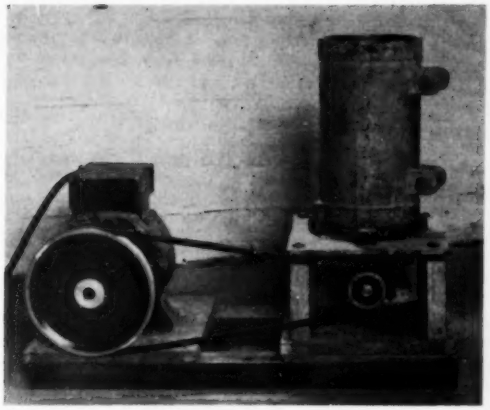


Fig. 1. The vibrating table with test cylinder mold. The mold is clamped to a high-frequency vibrating table and the time required to bring free moisture to the surface is recorded.

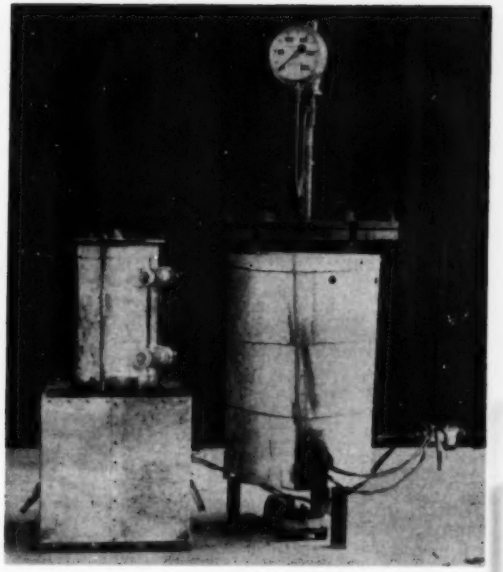


Fig. 2. Autoclave with special cylinder mold. Accelerated testing was conducted at periods up to 24 hours operating at 100 lb. p.s.i., 350 deg. F.

tained. There are also the contentions of such authorities as M. Feret, that gap gradings are actually preferable to continuous gradings.

There is surprising paucity in concrete literature on the subject of "poor gradings," limited to an occasional expression of what may almost be called surprise, where such gradings have been used successfully. The term "poor" however, has no real significance beyond the fact that it has become generally accepted that the grading of aggregates for concrete should comply with certain continually narrowing limitations, and that they should be continuous so that "gaps" in the grading are avoided. Selection of materials in the coarse grading range is relatively simple where arrangements of crushers and screens can present the desired size separation. On the other hand, the fine aggregate or sand may or may not be readily available in its natural state in the desired grading. If suitable sand is not procurable locally, the transportation of "acceptable" material over considerable distances can be uneconomical, while the production of crusher fines is generally unsatisfactory.

A further aspect of the problem which demands attention is the rapid depletion of existing sand and gravel deposits and the difficulty of finding new deposits which can be worked economically. The problem is world wide, in view of the enormous and immediate demands for concrete, while natural sand production is a matter for geological ages. A paper entitled, *Considerations Affecting the Use of Natural Occurring Aggregates in Concrete,* by M. D. Armstrong in *The Surveyor and Municipal and County Engineer,* April 28, 1950, pointed out that, at the present rate of consumption, the existing reserves of quality sand and gravel in Great Britain will be largely depleted within the next 20 to 30 years.

Except in those larger cities which have a well-established and controlled aggregate supply, every time we break new ground, the problem of selecting the most suitable aggregates at the lowest cost has to be faced. Although it is appreciated that the selection of suitable coarse and fine aggregates involves considerably more than the question of their grading, the following remarks assume sound particles, neither especially rounded nor flaky, and are primarily directed at the grading of the fine aggregates. It is appreciated that there are extensive areas where there is a dearth of coarse aggregates; nevertheless, generally speaking, coarse aggregates are more readily available and more easily graded than fine aggregates. This ease of grading is primarily because it is generally simple and inexpensive to make separation of coarse particles by screening and then recombining the separated sizes in any desirable proportions. The sand or fine aggregate grading, on the other hand, is not only expensive to modify, but has a more critical effect upon the workability and other concrete-making properties.

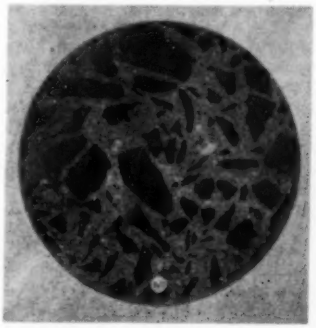


Fig. 3. Typical section cut from test cylinder. Permeability test disc shows characteristics of gap grading, in this case G1567, i.e., all fine aggregate between No. 16 and No. 100 mesh, all coarse aggregate between 1½ in. and ⅜ in.

Surely it is undesirable to demand continuous gradings which will cause hardship or unduly increase the cost of the work, unless it has been established beyond doubt that such gradings are essential. It is contended that the practical necessity for close adherence to grading has not been established to the point demanded by our specifications. This statement is not intended as a criticism of the present generally-accepted fine aggregate specifications; rather, it is an expression of the view that blind acceptance of such

specifications can tend to limit the use of concrete in many areas of the world. Continued narrowing of the grading limitations may result in better concrete where such limitations are practicable, and as such is generally in line with modern scientific advances; but what about the less fortunate locations where such gradings cannot be economically obtained?

Author's Investigations

Partly through the force of circumstances of his past work and its location, and partly through a general liking for research, the author has devoted time to an examination of the effects of aggregate gradings upon the behavior of concrete mixes in an endeavor to solve the problem. The initial step was the adoption of "gap gradings" as the stalking horse with which to approach the "law" of grading. This procedure was chosen because past experience had shown that gaps in the aggregate grading could prove advantageous and because the most readily available and least expensive aggregates, or their combinations, generally contain gaps; it was considered that the assumption of continuous grading had proved an unsatisfactory basis for practical mix design.

The studies and investigations covered endeavors to establish some natural law, a theoretical link between aggregate grading and mix behavior. It was assumed throughout the work that the aggregate particles were chemically inert and that their physical characteristics did not conflict with those of the matrix. This is perhaps theoretically impossible, but nevertheless it must be accepted that any pronounced departure from the requirement should automatically exclude the use of that material as concrete aggregate.

Separating the aggregate into various size groups, they were recombined so that the resulting combinations presented borderline cases or fell outside the limits of most grading specifications. Their behavior in concrete mixes under hand tamping and vibration was then examined, their tendencies to segregation were observed, and the relative effects upon strength and permeability were determined. This involved the development of some new equipment and led into various secondary fields of investigation with ever-widening avenues for research, vying in interest with the original aim. It included and extended beyond the present standard methods for testing concrete by the development of a vibrating method for compaction (see Fig. 1), autoclave curing for accelerated tests (see Fig. 2), modulus of rupture and permeability testing techniques, with investigations relative to entrained air, workability, and types of failure.

The nomenclature which the author has devised and adopted for the purpose of defining the various mixes is to indicate gaps in the grading by G with the appropriate suffix to indicate the size group omitted, thus:

G1 indicates omission of 0-100 size group in aggregate grading.
G2 indicates omission of 50-100 size group in aggregate grading.
G3 indicates omission of 30-50 size group in aggregate grading.
G4 indicates omission of 16-30 size group in aggregate grading.
G5 indicates omission of 8-16 size group in aggregate grading.
G6 indicates omission of 4-8 size group in aggregate grading.
G7 indicates omission of ⅜-4 size group in aggregate grading.
G8 indicates omission of ¾-⅜ size group in aggregate grading.

All mixes investigated contained the 1½ to ¾ in. size group in order to maintain the same maximum size of aggregate throughout tests. It is to be noted however that the adoption of a grading lacking any of the size groups does not mean complete absence of such size particles, because of the grinding action during mixing. This was the subject of a separate investigation.

The materials for the various mixes were weighed and ready to enter the mixer immediately upon discharge of the priming mix. This priming mix, as well as the method for charging the mixer with materials and water, was in accordance with the standard procedure outlined by the U. S. Bureau of Reclamation in its *Concrete Manual*. The subsequent making of a slump test and procedure for hand tamping, capping, and compression testing of concrete cylinders, were conducted in accordance wtih the appropriate Australian Standard Specification. The time of mixing was adopted as five minutes and maintained as standard throughout the tests. Although perhaps excessive, it was considered that this time would be adequate to overcome any mixer characteristics which might be introduced through the various gradings.

Nine 6-in.-dia. by 12-in. test cylinders were made for each mix, three receiving standard hand-tamping, and the other six being vibrated. It was interesting to observe that from the overall handling standpoint, it required the same time to hand-tamp three as to vibrate six, and took considerably less effort. The three "standard" cylinders from each mix were used for control purposes, received standard capping and curing, and were subjected to the compression test at seven days. Preliminary tests established that in order to obtain a true cross-section of the mix, the most desirable order for casting the six vibrated cylinders was to set the first, fourth, and sixth aside for standard capping, curing, and compression testing at seven days. These three were used for direct comparison with those which had been hand-tamped. The second cylinder vibrated was immediately placed in the autoclave; the third specimen was set aside for the cutting of sections (see Fig. 3) and permeability testing; and the fifth specimen was retained for later investigations as and when required.

Summaries of the aggregate gradings covered and corresponding test results are given in Tables I and II in order to present a general picture of the extent of the experimentation. Testing procedure, conditions, and results have been presented in considerable detail because of the specialized nature of this somewhat limited investigation. The author suggests that the reader can thereby check the basis for the following brief summary of conclusions and decide for himself whether he considers those conclusions to have been correctly drawn or otherwise. It is further suggested that the reader may care to go further and derive alternative or additional conclusions from the data submitted.

Conclusions

Although some of the conclusions are opposed to generally accepted thought on the subject, it is contended that they can all be supported by logical reasoning. It would perhaps be more correct to say that the results of this investigation appear to confirm theoretical deliberations. Thus, with full appreciation of the necessity for conducting large numbers of tests and the application of statistical analysis to data relative to concrete, it is believed that the following presents a new approach to the problem of concrete mix behavior and leads to more extensive investigations. With this latter thought in mind, some of the conclusions have been presented to read as recommendations. Other conclusions endorse accepted views and the work of other investigators.

TABLE I. AGGREGATE GRADINGS INVESTIGATED.

Mix Gap Classification	Experimental Record No.	Percentage in Size Groups before Mixing								
		-100	50-100	30-50	16-30	8-16	4-8	⅜ - 4	¾ - ⅜	1½ - ¾
	W/C-0.50									
G.1.	A.1-9	(G1)	6.6	6.7	6.7	6.7	6.6	22.3	22.3	22.2
G.1357	D.1-9	(G1)	11.1	(G3)	11.1	(G5)	11.1	(G7)	33.4	33.3
G.1569	E.1-9	(G1)	11.2	11.0	11.1	(G5)	(G6)	(G7)	33.4	33.3
G.13457	C.1-10	(G1)	16.7	(G3)	(G4)	16.6	(G6)	(G7)	33.4	33.3
G.13468	B.1-9	(G1)	16.7	(G3)	(G4)	16.6	(G6)	33.4	(G8)	33.3
G.124578	F.1-9	(G1)	(G2)	16.7	(G4)	(G5)	16.6	(G7)	(G8)	66.7
	W/C-0.60									
-	G.1-9	6.7	6.6	6.7	6.7	6.6	6.7	20	20	20
-	H.1-9	6.7	6.6	6.7	6.7	6.6	6.7	6.7	26.7	26.6
-	I.1-9	6.7	6.6	6.7	6.7	6.6	6.7	6.7	6.6	46.7
G1	J.1-9	(G1)	8	8	8	8	8	20	20	20
G2	W.1-9	10	(G2)	7.5	7.5	7.5	7.5	20	20	20
G3	X.1-9	6.6	6.7	(G3)	8.9	8.9	8.9	20	20	20
G4	Y.1-9	8.9	9.0	8.8	(G4)	6.6	6.7	20	20	20
G5	EX.1-9	7.5	7.5	7.5	7.5	(G5)	10	20	20	20
G6	DX.1-9	8.0	8.0	8.0	8.0	(G6)	20	20	20	20
G7	HX.1-9	6.7	6.6	6.7	6.7	6.6	6.7	(G7)	30	30
G8	IX.1-9	6.7	6.6	6.7	6.7	6.6	6.7	30	(G8)	30
G12	K.1-9	(G1)	(G2)	10	10	10	10	20	20	20
G23	Z.1-9	10	(G2)	(G3)	10	10	10	20	20	20
G34	AX.1-9	10	10	(G3)	(G4)	10	10	20	20	20
G45	U.1-9	10	10	10	(G4)	(G5)	10	20	20	20
G67	JX.1-9	8	8	8	8	8	(G6)	(G7)	30	30
G78	FX.1-9	6.7	6.6	6.7	6.7	6.6	6.7	(G7)	(G8)	60
G156	L.1-9	(G1)	13.3	13.4	13.3	(G5)	(G6)	20	20	20
G357	V.1-9	6.7	6.6	(G3)	13.4	(G5)	13.3	(G7)	30	30
G567	T.1-9	10	10	10	10	(G5)	(G6)	(G7)	30	30
G2367	CX.1-9	10	(G2)	(G3)	15	15	(G6)	(G7)	30	30
G2368	F.1-9	10	(G2)	(G3)	15	15	(G6)	30	(G8)	30
G2467	GX.1-9	10	(G2)	15	(G4)	15	(G6)	(G7)	30	30
G2468	Q.1-9	10	(G2)	15	(G4)	15	(G6)	30	(G8)	30
G3467	N.1-9	10	10	(G3)	(G4)	20	(G6)	(G7)	30	30
G3468	M.1-9	10	10	(G3)	(G4)	20	(G6)	30	(G8)	30
G3478	BX.1-9	10	10	(G3)	(G4)	10	10	(G7)	(G8)	60
G4578	O.11-19	6.7	6.6	6.7	(G4)	(G5)	20	(G7)	(G8)	60
	W/C-0.70									
-	R.1-9	8.3	8.4	8.3	8.3	8.4	8.3	16.7	16.6	16.7
G67	S.1-9	10	10	10	10	10	(G6)	(G7)	25	25

Extension of Strength Law

Provided concrete is compacted to the point where air pockets are eliminated, the compressive strength and other properties of the hardened concrete will be independent of the aggregate grading, method of compaction, and plasticity of the mix. This statement presents an extension of the original water-cement ratio strength law which required "given materials and conditions of manipulation" and was only applicable to "plastic" concrete.

It is submitted that the various data with reference to compression strengths and unit weights, with corresponding average deviations and comparative workability for the different mixes, presents sufficient support for this conclusion.

Effect of Grading Upon Concrete Segregation

Grading of the aggregates for concrete is important only insofar as the avoidance of segregation, ease of placing, and avoidance of air pockets in the concrete are concerned. This statement is corollary of the above conclusion and presents the hypothesis that grading of aggregates is a practical consideration which is dependent upon placing methods and workmanship.

Provision against segregation or else the desire to produce concrete with a specific degree of workability appears to provide the only justification for any close limits for continuous aggregate grading specifications with mixes having fixed cement and water contents. The effect of quite considerable departures from such exact gradings can frequently be overcome by the adoption of handling arrangements from mixer to final location of concrete which provide for the avoidance of segregation, while if such departures are properly planned, it is possible to produce improved work-ability with reduction in time of vibration for vibration for placing.

Segregation in concrete, or the separation of aggregate particles from the water and cement paste, occurs whenever the forces of separation exceed those of cohesion. The forces of separation may be those of gravity or momentum, while the forces of cohesion may combine molecular attraction between smallest particles, surface tension, and the resistance of larger particles to displacement by sliding and through interlocking of the grains.

If there are excessive gaps in the grading of the solids, the cohesion within the mix becomes insufficient to prevent the particles from separating; if there is excessive water present, the water will flow out through the voids and carry away the aggregate particles. Continued mixing, agitation, or limited delays between mixing and placing can present increased molecular attraction with surface tension in the cement paste, resulting in decreased segregation; this same state can also be produced by the addition of certain air-entrainers and plasticizing agents.

Provided that concrete is capable of being properly placed, any subsequent water loss is advantageous through lowering of the effective water-cement ratio, provided the formation of the laitance is avoided.

Grading for Concrete Aggregates

The grading of concrete aggregates is basically important only insofar as it affects segregation and the placeability of the concrete. Thus grading presents a factor in the relationship between water-cement ratio, paste-aggregate ratio, and the variable requirements of field handling, but (provided that the mix is thoroughly compacted) has no further influence upon the compression strength and other desirable properties of the hardened concrete.

The quantity of aggregate which can be introduced into the concrete mix for any fixed water-cement ratio in order to present a desired degree of workability is dependent upon the type of aggregate and its grading, *i.e.*

Corollary I. The grading for any one type and maximum size of aggregate for fixed water-cement ratio controls the paste-aggregate relationship under given conditions of plasticity and workability.

This has led to the formulation of rules for aggregate gradings based upon statistical examination of the behavior of concrete mixes containing such gradings. However, there can be only one ideal grading for any one type of aggregate and water-cement-aggregate relationship which will present a specific degree of resistance to segregation under the particular mixing and handling conditions and for the required placeability under the particular condi-

tions of working and compaction, *i.e.*

Corollary II. The grading of aggregates for any water-cement-aggregate relationship governs the tendency of the mix to segregate and the placeability.

The appropriate ideal grading will vary so greatly with different job conditions, and can depart so vastly from any standardized continuous gradings as based upon theory or from practical experimentation under limited conditions, that endeavors to apply any fixed grading conditions must be fallacious. The number of variables which can influence the desirable grading include shape of aggregate particles. Even within gravels there can be considerable variations, while types of crushed particles cover a very wide range, dependent upon rock crushers. Maximum size of aggregate, as available or required for placing conditions, segregation, and placeability are variable functions of local conditions and details of the mixer operation; handling and compaction can be expected to vary not only from one job to another but within any one job.

Corollary III. The many variable factors and coincidences which influence the arrangement of aggregate particles under different operational conditions precludes the application of theory or empirical formulae to present any close and general relationship between grading and behavior of the fresh concrete.

The above is tacit acknowledgment that not only are the number of variables involved in mix design too great for the application of mathematics, but that the application of empirical rules based upon investigations under different conditions should be avoided. It is thus apparent that modifications of mixing, handling, and placing procedures can make it practicable to use available gradings with less expensive aggregates rather than to persist with endeavors to fix both grading conditions and job methods. Such modifications can be confidently made with the knowledge that irrespective of any tendencies to segregate or even difficulties in compaction, the resulting properties of compacted concrete will not be affected, *i.e.*

Corollary IV. The grading of aggregates for any water-cement-aggregate relationship has no influence upon the compression strength and other desirable properties of the hardened concrete, provided that the mix is thoroughly compacted.

In conclusion, it is recommended that preference in any selection of aggregates, other considerations being equal, must be given to those which present the most constant grading as this will simplify control during operations. However, it must be accepted that some variations in grading can always be expected and will require mix adjustments. It is not contended that all gradings will make good concrete for the given water-cement ratio; it may be necessary to procure more expensive aggregates in order to reduce the paste-aggregate ratio. However, it is contended that readily available gradings should not be prohibited solely because they depart from some previously accepted basis.

TABLE II — SUMMARY OF TEST RESULTS

Mix Gap Classification	Experimental Record No.	Workability Factor	Slump in Inches	Vibration in seconds	Average Weight per cubic foot		Average Compression Strength - three specimens	
					Vibrated	Hand tamped	Vibrated	Hand-tamped.
	W/C=0.50							
G1	A.1-9	11	1/4"	70	165	158	3,807	2,903
G1357	D.1-9	9	1/4"	31	164	164	3,570	3,313
G1567	E.1-9	10	-	40	163 1/2	155	3,612	2,436
G13467	C.1-10	9	-	35	163	162	3,818	3,148
G13468	B.1-9	10 1/2	-	105	162 1/2	154	3,933 +	2,177
G124578	F.1-9	9	1/4"	26	165	164 1/2	2,920	2,916
	W/C=0.60							
-	G.1-9	5	1 1/2"	15	159	159	2,463	2,543
-	H.1-9	6	1 1/2"	15	160	160 1/2	2,750	2,592
-	I.1-9	4 1/2	1 1/2"	11	160 1/2	160 1/2	2,722	2,448
G1	J.1-9	5 1/2	1 1/2"	13	159	158 1/2	2,535	2,658
G2	W.1-9	7 1/2	3"	7	159	159	2,715	2,860
G3	X.1-9	7	3 1/2"	7	159	159	2,623	2,717
G4	Y.1-9	6	1 1/2"	13	159	158 1/2	2,633	2,788
G5	EX.1-9	7 1/2	1 1/2"	12	159	158	2,452	2,612
G6	DX.1-9	5 1/2	2 1/2"	8	158	158	2,670	2,592
G7	HX.1-9	4 1/2	2 1/2"	7	159	158	2,672	2,585
G8	IX.1-9	8	1 1/2"	10	159	158 1/2	2,640	2,792
G12	K.1-9	10 1/2	1/4"	7	158	159	2,240	2,247
G23	Z.1-9	8 1/2	3"	12	159 1/2	158 1/2	2,482	2,587
G34	AX.1-9	10	1 1/2"	12	158	158 1/2	2,550	2,565
G45	U.1-9	4 1/2	1 1/2"	12	158	157	2,812	2,733
G67	JX.1-9	8	1 1/2"	12	158	157 1/2	2,628	2,600
G78	FX.1-9	6	4 1/2"	7	159 1/2	160	2,568	2,472
G156	L.1-9	8	1/4"	13	156 1/2	157	2,412	2,327
G357	V.1-9	6 1/2	5 1/2"	7	160	160 1/2	2,248	2,320
G567	T.1-9	8	1 1/2"	16	157	157	2,660	2,632
G2367	CX.1-9	7	2"	8	160	159	2,673	2,712
G2368	P.1-9	7	1 1/2"	8	157 1/2	158 1/2	2,860	3,015
G2467	GX.1-9	6	2 1/2"	13	159	158 1/2	2,733	2,822
G2468	Q.1-9	7 1/2	2"	8	158	159	2,857	2,983
G3467	N.1-9	5	1 1/2"	8	159	159	2,572	2,510
G3468	M.1-9	4 1/2	1/4"	14	158	158	2,728	2,608
G3478	BX.1-9	9	2 1/2"	8	160	160	2,453	2,430
G4578	O.11-19	10 1/2	5"	7	160 1/2	161	2,238	1,852
	W/C=0.70							
-	R.1-9	6 1/2	8"	3	154 1/2	156	2,013	2,118
G67	S.1-9	6 1/2	7 1/2"	3	154	155	2,085	2,103

Industrial Uses of Talc Explained in New Booklet

Food processing, paints, roofing, insecticides, pharmaceuticals, and cosmetics are a few of the 144 industrial uses for talc listed in the loose leaf booklet "Talcs" prepared by Whittaker, Clark, and Daniels, Inc., 260 W. Broadway, New York 13, N. Y.

The booklet describes talcs and the related pyrophyllite and soapstone, in non-technical language: gives the principal uses and the location of deposits.

A use encyclopedia lists the 144 most important uses and suggests the type of talc best suited for the desired results. Following the use listing is a section containing the physical and chemical properties of the 63 kinds of talc given. Interspersed through this section are photographs of talc mining operations in several countries and photomicrographs of some of the more important types showing the microscopic structure.

A new record for boron production was established in 1950 when 647,735 tons of boron minerals were produced. This was valued at $15,890,000. Consumption and exports both were at the highest levels known.

Spokesmen of Wyandot Dolomite, Inc., Carey, O., have announced the removal of their general offices to 109 West Findlay Street in Carey.

Direct Drives For Grinding Mills

By E. J. KLOVERS
Basic Industries
Machinery Department
Allis-Chalmers Mfg. Co.

SELECTION of proper drives for grinding mills is very important because of the high torques involved. On a 7- by 26-ft. mill, for example, up to 80,000 lbs. of grinding media must be lifted on starting and the load does not lessen appreciably during operation. Furthermore, on wet grindings the material often solidifies on the bottom of the mill during week-end shutdowns. In addition, continuous rotation of heavy loads puts a constant stress on the bearings and drive.

Mill drives can be divided broadly into two types—direct, in which the driving pinion and motor rotate at the same speed; and indirect, in which a V-belt drive or other speed reduction system is introduced between the motor and the machine.

Direct drives are generally employed on grinding mills where power requirements are in excess of 250 hp. There are some eight varieties of direct drives for grinding mills, each offering particular advantages and disadvantages.

For drives under 250 hp., speed reduction by Texrope drive has proven satisfactory. This type is inexpensive, and minor speed changes can be made by varying the size of the motor sheave. In addition, the V-belts serve to soften the drive and isolate the motor from vibration.

Illustrations of various direct drives are shown. Drives 1-A through 4-A are known as stiff drives, 1-B through 4-B as soft drives. Drive 1-A is the simplest type of direct drive but it can be troublesome. The motor and pinion shaft are joined by a rigid coupling. This is equivalent to a single shaft with four bearings. The two bearings of the motor must be in perfect alignment with the pinion shaft bearings. If alignment is poor, the bearings will wear out rapidly. The worse the alignment, the shorter the bearing life.

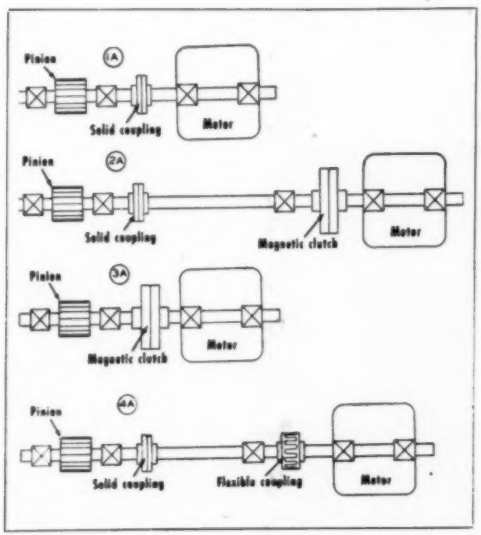
The flexible coupling—Drive 1-B—permits some degree of misalignment. It permits the use of roller bearings with their low co-efficient of friction and low maintenance. While it is true that careful erection can place all drive components in alignment, the alignment can be lost during operation if the foundation settles or vibration flexes the supporting beam.

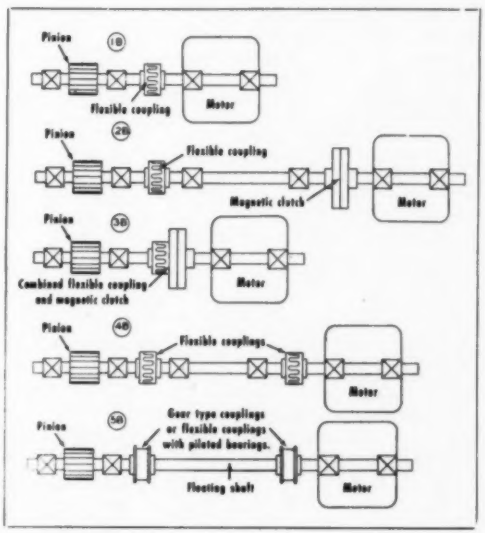
Drive 1-B may be mechanically ideal, having the advantage of being compact and easily maintained. But electrically, it may be far from satisfactory because of demands on the power utility.

A direct-drive mill motor rotates between 180 to 450 r.p.m., while the horsepower demand will be between 250 and 1,000. Generally, it is in a class of two to three hp. per rpm. Sometimes an induction motor can be used, but in most cases its efficiency will be so low that many manufacturers refuse to build it. A synchronous motor seems to be the solution, especially since its capacitance can improve the overall plant power factor. A synchronous motor, however, must also have a large starting current demand so as to develop sufficient starting torque to start a mill. Many utilities will not tolerate this. Consequently, the transmission line and generator must be considered part of a mill drive.

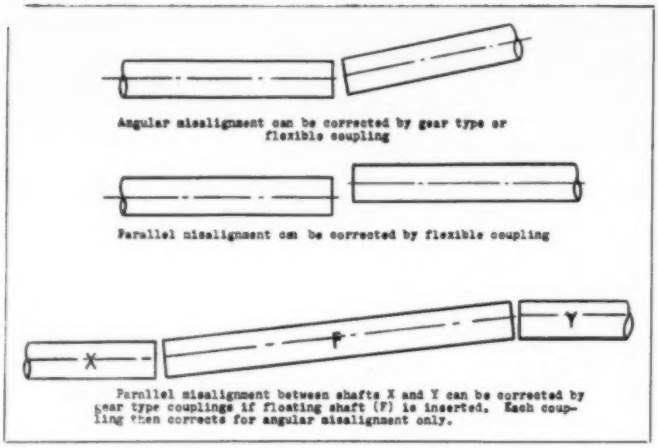
If the utility will not permit the peak starting demand, a high torque synchronous motor may be used. This type of motor starts as a wound rotor induction motor with relatively low starting current demand and reverts to synchronous operation when up to synchronous speed. It has advantages but its cost is usually prohibitive.

A normal torque synchronous motor does not rate consideration because of its low torques: 40 percent starting, 30 percent pull-in and 175





Left: Illustrations of stiff drives. Right: soft drives.


Angular misalignment can be corrected by gear type or flexible coupling
Parallel misalignment can be corrected by flexible coupling
X
F
Y
Parallel misalignment between shafts X and Y can be corrected by gear type couplings if floating shaft (F) is inserted. Each coupling then corrects for angular misalignment only.

• Types of shaft misalignment, all exaggerated for illustration.

are built so that all grinding mills are in one section, while motors are in an adjoining room. This arrangement was popular in cement plants where the mill room air was fouled with dust. Dust collectors have solved the dust problem, but many operators still prefer a separate motor room for electrical equipment.

Drive 2-B (or its modifications 4-B and 5-B) is often used where a long drive is needed to place the electrical equipment in a separate room. The pinion shaft extension may become as long as 20 ft., and may act in torsion to soften the drive. This practice is not recommended because the shaft diameter usually has to be reduced dangerously close to minimum diameter before becoming an effective torsional member.

Drive 5-B uses gear type alignment couplings or flexible couplings with

percent pull-out torque. Its starting current demand is low, but its starting torque cannot bring a mill up to speed. A clutch, however, permits the motor to start unloaded and take up the load gradually. Although mechanical clutches work, they are large and costly; so magnetic clutches are used instead. The magnetic clutch, unlike the mechanical, permits the synchronous motor to run as a synchronous condenser when the mill is idle for maintenance or repairs.

The magnetic clutch is shown mounted in Drive 2-A and 2-B, modifications of 1-A and 1-B. Note that Drive 2-A shows a three-bearing pinion shaft. In fact, five shaft bearings and the clutch pilot bearing must be aligned accurately. A rigid coupling does not require that the pinion shaft extension be supported. Any shaft extension used with magnetic clutches and spring type flexible couplings must be supported by two adjacent bearings.

A magnetic clutch is not a flexible coupling. It does not allow for any misalignment and it does not soften the drive. Therefore, 2-A is not recommended; 2-B is a good drive but it is lengthy.

Drive 4-A substitutes the flexible coupling for the magnetic clutch as shown in 2-A. This improves the drive. The flexible coupling softens what would be a stiff drive. The arrangement, however, requires perfect alignment of the two pinion-shaft bearings and the bearing on the pinionshaft extension—not an easy alignment to make or keep.

Clutch and coupling manufacturers co-operated to produce a combined clutch and coupling as shown in Drive 3-B. The hub of the clutch has been replaced with a flexible coupling hub, thereby eliminating the shaft extension and its two bearings. While 3-B is a good drive, it does have erection and operational difficulties not found in 2-B.

In an effort to save space, Drive 3-A has been resorted to. Here the magnetic clutch has been substituted for the rigid coupling used in 1-A. Drive 3-A saves space but lacks the flexible coupling which eliminates vibration troubles. This drive is not recommended.

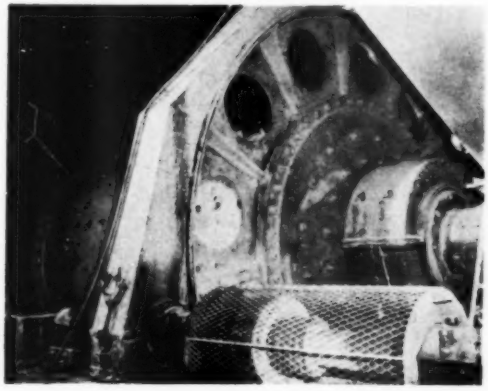
Many plants piloted bearings. Neither type requires that the pinion shaft extension be supported by any bearings. The gear type coupling does not cushion the drive as well, however. The piloted flexible couplings limit the weight and length of the floating shaft, but not to any great extent. The piloted type flexible couplings and the floating shaft can be used

(*Continued on page* 102)

Synchronous Motor Characteristics

Synchronous Motor Type	Starting Torque	Pull in Torque	Pull Out Torque	Starting Amp.	Approximate Comparative Costs
Normal torque (with magnetic clutch)	10%[1] 40%[2]	30%	175%	75%[1] 150%[3]	102%[9]
High torque (no magnetic clutch)	160%[2]	140%	225%	550%[2]	100%[7]
Two step part-wound	85%[4] 170%[5]	140%	225%	280%[4] 550%[5]	104%[8]
Synchronous-induction	150%		150%	250%[1]	117%[9]

[1] At 50% of full voltage.
[2] At full voltage.
[3] Current peaks at 150% when clutch is energized.
[4] At first step of part-wound motor.
[5] At second step of part-wound motor.
[6] Costs include motor, magnetic clutch, flexible coupling, and reduced voltage starter.
[7] Costs include motor, flexible coupling, and full voltage starter.
[8] Costs include motor, flexible coupling, and two-step, part-winding full voltage starter.
[9] Costs include motor, flexible coupling, and reduced voltage starter.



• Discharge end of a preliminator in a Midwestern cement plant. Note the wire guard over the flexible coupling.

Work Reviewed, Plans Outlined At N.C.S.A.'s Summer Meeting

another ON THE SPOT report

THE annual summer meeting of the board of directors of the National Crushed Stone Association was held on July 19, 1951, at The Homestead, Hot Springs, Va. It was preceded on July 18 by a meeting of the executive committee. Both

By WALTER E. TRAUFFER

meetings were, as usual, well attended, with a majority of the directors, honorary members, and invited guests present. Both meetings disposed of a large amount of important business and both lasted all day and into the night. Chairman J. Reid Callanan presided. It was decided to hold the 1952 summer meeting at The Homestead in July, the date to be decided later. Those present were saddened by the announcement of the death on July 16 of W. H. Wallace (Wallace Stone Co., Bay Port, Mich.), an active member of the association for many years. The recent birth of twin sons to Mr. and Mrs. W. S. Weston Jr. (Weston & Brooker Co., Columbia, S. C.) explained the absence of Mr. Weston from the meeting.

In his report to the board, J. R. Boyd, administrative director of the association, reviewed the effect on the crushed stone industry of the limitations which have been imposed on price, wage, and salary increases,

J. E. Gray, field engineer, N.C.S.A.

J. Reid Callanan, Callanan Road Improvement Co., chairman, N.C.S.A. executive committee.

and the difficulty of obtaining maintenance, repair, and operating supplies (MRO) and capital equipment. These controls and the rapid acceleration of the Defense Mobilization Program have, he said, imposed a heavy load on the association staff in keeping members advised of developments of importance to them.

Mr. Boyd expects a clarification of the price control situation soon, especially as it affects the crushed stone industry. A request is being made that OPS appoint an Industry Advisory Committee for crushed stone and other aggregates, and an N. C. S. A. committee has been authorized to nominate candidates for it. Regarding priority controls, Mr. Boyd said that serial numbers are being issued rapidly and that those who have used the simplified application form have obtained the fastest service. He also reported on construction control, minimum wages, and the association's statement protesting a 6 percent general increase in freight rates. Under the direction of the Accident Prevention Committee, the association is about to issue a monthly accident review which is expected to be a real contribution to the safety program. Mr. Boyd concluded with the report that financial affairs of the association are in excellent condition.

A. F. Goldbeck, engineering director, reported on the work completed or in progress under his direction during the first half of the year. A wide variety of laboratory tests and investigations were made directly at the request of members or because of a general need for them. Stone sand, bituminous mixtures, and expansion in concrete were some of the many subjects investigated. Mr. Goldbeck also mentioned the recognition which this work of the association has received in the form of honors which have recently been bestowed upon him. He is now first vice-president of the American Concrete Institute. In January he was one of two men to receive Distinguished Service Awards from the Highway Research Board for "Distinguished Service in Highway Research;" and in June he was one of five men to be made an honorary member of the American Society for Testing Materials.

J. E. Gray, field engineer, said that in the last six months his work has consisted largely of rendering technical service to individual companies. This involved extensive travel over a large area of the country. He described some of the variety of interesting problems worked on during this period, including quality of stone, portland cement concrete problems, deleterious materials, use of screenings in bituminous surface mixtures, stone sand, crushed stone base courses, etc. Mr. Gray also de-

J. R. Boyd, administration director of N.C.S.A.

scribed other phases of his work in helping members with operating, administrative, and related problems.

Russell Rarey (Marble Cliff Quarries Corp., Columbus, O), chairman of the Bylaws Committee, reported on suggested changes in the bylaws of the association which were considered necessary to meet changing needs and conditions. The executive committee was reported to have burned the midnight oil discussing these suggested changes, and the board also gave them long and serious consideration before adopting them. Included were changes in procedure, elections, powers, and committees, and the elimination of one of the two board meetings at the annual convention. It is now also possible for a past-president of the association to continue as a nonvoting member of the board, even if another member of his company is a voting member. This makes it possible to bring rising younger men into the board without losing the invaluable advice and experience of these ex-presidents.

P. E. Heim (Carbon Limestone Co., Youngstown, O), representing the Agricultural Limestone Institute as chairman, gave a brief report on the recent board meeting of that body. He also mentioned the progress made to date on the proposed merger of the A. L. I. and the National Agricultural Limestone Assn.

Philip E. Heim

Horace Krause (Columbia Quarry Corp., St. Louis, Mo.) reported on the progress made to date in obtaining percentage depletion for the industry. He was optimistic about 5 percent allowance and thought 15 percent a possibility. Warren C. Rowe (Rowe Contracting Co., Malden, Mass.), chairman of the Group Insurance Committee, reported its recommendations. He introduced a tax consultant who had worked out a plan which met with the approval of the committee. It was voted to leave the details of this plan to the committee.

Otho M. Graves (General Crushed Stone Co., Easton, Pa.), chairman of the Convention Arrangements Committee, gave an outline of the program for the next annual convention and machinery exposition to be held at the Stevens Hotel, Chicago. On Saturday morning, February 16, there will be a meeting of the board of directors of the N. C. S. A. Manufacturers' Division. On Sunday, February 17, the A. L. I. board will meet in the morning and the N. C. S. A. board in the afternoon. On Monday, February 18, both associations will have separate meetings in the morning, followed by a joint greeting luncheon. The afternoon will be devoted to inspection of the machinery exhibits and in the evening, a cocktail party and buffet supper are scheduled. On Tuesday, February 19, the machinery exhibits will be open in the morning and there will be a Manufacturers' Division luncheon and separate meetings in the afternoon. On Wednesday, February 20, the morning will again be left open for the exhibits. There will be a joint meeting of both associations in the afternoon, and the annual banquet will be held in the evening.

Washington News Letter

(*From page* 92)

before taxes fell for the first time in over a year. This reflects several forces at work. First of all, many companies were in the process of converting to defense production. This was expensive in terms of the cost of new equipment and also often required that operations be shut down for a while. Second, in the earlier boom many companies marked up the value of their inventory, higher than later turned out to be warranted. Now they were forced to mark it down to more reasonable levels. Third, the buying boom had slowed down a great deal by the second quarter of this year. Many retailers, wholesalers, and even manufacturers were required to reduce prices to move their merchandise. The high tax rate continued. Therefore, although profits before taxes continued higher than in the third quarter of 1950, profits after taxes turned out to be lower than in that earlier quarter.

Corporate taxes are still going up. The trend of profits and taxes found in the first half of 1951 is almost sure to continue for a long time.

Direct Drives

(*From page* 100)

on most drives requiring a pinion-shaft extension.

In conclusion then, Drives 1-A through 4-A are not recommended. The others are recommended with qualifications. Drive 1-B is suitable when an induction motor can be used, when the power company will permit a high starting current for high torque synchronous motors, or when the operator can pay for a high torque synchronous motor.

Drive 2-B is satisfactory for normal torque synchronous motors where it is possible to place the motor at a distance from the pinion.

Drive 3-B is recommended for normal torque synchronous motors where space limitations demand that the motor be placed as near the pinion as possible.

Drives 4-B and 5-B apply to the same types of motors as used in 1-B, but when the motor is to be placed at a distance from the pinion.

N. Y. Sand-Gravel, R.M.C. Men Organize New Association

Harry A. Barney, Binghamton, N. Y., vice-president and general manager of Barney and Dickenson, Vestal, N. Y., is the first president of the Empire State Sand, Gravel and Ready-Mix Association.

This association was recently organized to replace the defunct Empire State Sand and Gravel Producers Association. Other officers are: Leon Wendell, Lockport, N. Y., vice-president; W. W. Nass, Syracuse, secretary; and John Hopkins, Albany, treasurer.

Sulphur quotas for the third quarter were announced by the Office of International Trade. The quotas are the same as those for the second quarter and amount to 250,000 tons. This is about 19 percent of the current production in the U.S.

International Minerals and Chemical Corporation has purchased Thomson Phosphate Company, both of Chicago, Ill. International Minerals also announced that new buildings at its Texarkana, Ark., plant will increase that operation about 50 percent.

Report on Current Labor Developments

S. HERBERT UNTERBERGER
Industrial & Labor Economist
Washington, D. C. — Philadelphia, Pa.

MERIT AND LENGTH OF SERVICE INCREASES

another P and Q exclusive

IT IS a rare employer indeed who does not adjust the compensation of at least some of his employees on the basis of their merit or length of service. Therefore, the new rules recently laid down by the Wage Stabilization Board's revised General Wage Regulation No. 5 must be understood and observed by practically every employer. Furthermore, many of them will be required to review their wage-and-salary-increase practices and to modify them in the light of the requirements of this new regulation.

The new rules apply only to employers whose jobs already have established rate ranges contained in a written schedule of rates which had been in effect on January 25, 1951, the date of the original wage freeze. To have such an established rate range requires that the job or job classification have minimum and maximum rates which have been clearly designated or are established by a specific formula (*e.g.* where the maximum is always 25 percent above the minimum). Where such established rate ranges do not exist, no merit or length-of-service increases may be granted until an application for the establishment of such rate ranges has been approved by the Wage Stabilization Board.

OPTIONAL METHODS

Under the Revised General Wage Regulation No. 5, merit or length-of-service increases may be made without Wage Stabilization Board approval, within established rate ranges, if they are made in accordance with any one of the following optional methods. Otherwise Board approval is required for each merit or length-of-service increase.

Since most employers would find it very burdensome to go to the Board each time they want to give a merit or length-of-service increase, it is almost essential for them to arrange their wage practices so as to conform with one of the following optional methods:

Past Practice Option In the first optional method, the Wage Stabilization Board has tried to develop a method whereby an employer could, insofar as it was consistent with the wage stabilization program, repeat in the current year his 1950 experience in giving merit and length-of-service increases. Essentially, they said that it is all right for an employer to grant as merit and length-of-service increases in the current year the same percentage of straight time payroll as he granted during the year 1950.

The Board prescribed the following method for calculating this amount:

(1) Select the payroll period in the calendar year 1950 in which the total number of employees was nearest the average for the year.

(2) Total the straight-time rates for the period selected in (1) above of all the employees in the group employed in jobs or job classifications with established rate ranges. This total may be expressed as an hourly, daily, weekly, monthly, or other rate in accordance with past payroll practice.

(3) Total the merit and length of service increases combined which were granted to employees in the group in the calendar year 1950. This total shall be expressed on the same rate basis (hourly, daily, weekly, monthly, etc.) as in (2) above.

(4) Express the increase granted as determined in (3) above as a percentage of the total rates as determined in (2) above; that is, divide (3) by (2).

Example: During 1950 there was an average of 305 employees in a group. There were some changes in the number employed, but for the December 16 payroll there were 300 employees, the nearest number to the average. On this payroll the total of the straight-time hourly rates paid was $420. Merit and length-of-service increases granted throughout the year totaled $21 on an hourly basis. Hence, the percentage of the increases granted to the straight-time payroll is $21 ÷ $420 or 5 percent. In converting from weekly to hourly, 40 hours per week was used, since this is the actual schedule. In converting from monthly to hourly, 20.8 days per month or 166 2/3 hours per month was used.

(5) Total the straight-time rates of employees in the group employed in jobs or job classifications with established rate ranges for the payroll period ending nearest January 15 of the current calendar year and apply the percentage computed in (4) to this total. The resulting figure is the total merit and length-of-service increases that may be granted in the current calendar year.

(6) If payrolls have increased during the course of the year, a larger fund for merit and length-of-service increases may be obtained by averaging the totals of the straight-time rates for the payroll periods ending nearest the 15th of each month of the year which has elapsed and applying the percentage computed in (4) above to this average.

Example: Consider the same example quoted under item (4) above. Assume that merit or length-of-service increases are to be given before April 15, 1951. Payroll periods ending nearest the 15th of each of the three months which has elapsed are used to determine the average payroll fund as shown below.

Payroll Period	Total Straight-time Hourly Rates
January 15, 1951	$560.00
February 15, 1951	595.00
March 15, 1951	618.00

Total 3 months, $1773; average 3 months, $591; 5 percent (past practice) of which equals $29.55.

In applying this method, two other points must be kept in mind:

(1) In distributing this amount, no employee shall be raised to a rate higher than the maximum of the established rate range of his job or job classification.

(2) All merit or length-of-service increases, including those granted to employees who thereafter quit or were thereafter promoted, transferred, or otherwise separated from their job classification, shall be charged against the allowable total. Increases granted to trainees, part-time and temporary employees, learners, or probationers, and increases resulting from promotions or transfers of employees shall not be charged against the allowable total.

The Board cited the following example of how this method works:

Assume that an appropriate group includes 100 employees in jobs or job classifications with established rate ranges. Assume further that the percentage calculated from the employer's past practice in accordance with (4) above comes to 6 percent. Suppose the employees are currently paid varying rates per hour which, when totalled, amount to

$150 per hour. Six percent of this total yields $9 per hour. The rates of the employees in the group may be increased by a total of $9 per hour. For instance, the rates of 60 employees may be increased 15 cents per hour; or the rates of 50 employees may be increased 10 cents per hour and the rates of 25 others may be increased by 16 cents per hour.

It is likely that this will be the optional method used by most employers. However, some will find it very restrictive, particularly if they were not able to give many merit or length-of-service increases during 1950 because business conditions did not permit, because very few employees qualified for such increases, or for other reasons. If the percentage figure calculated above is less than 6 percent, they will generally be better off using optional method 2.

Six Percent Option This optional method was designed specifically to take care of those situations where the 1950 experience was too restrictive or where there is no appropriate 1950 experience.

It is identical with the previous optional method except that instead of calculating a percentage based on the employer's own 1950 experience, the figure of 6 percent may be used, regardless of the 1950 experience.

In practice, the use of these two options is likely to work out as follows. If the calculation in Option 1 yields 6 percent or more, that option will be used; if it yields less than 6 percent, Option 2 will be used.

The 6 percent figure was arrived at by the Board after extensive study as one which would permit most employers sufficient freedom to operate a reasonable merit and length-of-service increase program.

Established Plan Option An employer could use either of the previous options whether or not he had been giving merit or length-of-service increases in accordance with a detailed predetermined plan.

If he has such a plan, however, the third optional method is designed to permit the employer to operate in conformity with the regulation without regard to any limits on the total amount which may be distributed. The definition of an "established plan" is very tight.

(1) It must have been contained on January 25, 1951, either in written collective bargaining agreement, or in a written statement of policy or procedure, or in a written notice that had been furnished to or posted for the employees or in some combination of these documents, and

(2) It must contain a schedule of rates with clearly designated minimum and maximum rates for each job or job classification, and

(3) In accordance with the normal operation of the plan the employee would normally be reviewed for a merit increase or entitled to a length-of-service increase at or before the time the increase is granted, and

(4) It must set forth maximum amounts or maximum percentages of merit or length-of-service increases which may normally be made; however,

(5) Even though the plan may have permitted merit or length-of-service increases to be granted in advance of otherwise normal minimum time intervals or in excess or other normal maximum amount or percentages, such increases may no longer be granted without prior Board approval.

Many employers were found to have *bonafide* established plans except for one thing: they did not specify maximum amounts or percentages of merit or length-of-service increases. To take care of them, the Board established the following rule:

If it otherwise qualifies, but does not specify maximum amounts or maximum percentages of merit or length-of-service increases which may normally be granted, a plan shall nonetheless be deemed to be an established plan if the average amount or average percentage of merit or length-of-service increases or both combined made in the current calendar year does not exceed the average amount or average percentage granted in the calendar year 1950. These respective averages shall be calculated by totalling the amounts or percentages of all the merit and length-of-service increases combined granted to individual employees under the plan during the calendar year 1950 and dividing by the total number of employees who received such increases. These computations shall exclude trainees, part-time and temporary employees, learners or probationers, and increases resulting from promotions or transfers of employees, as well as the increases granted to them.

Finally, if none of these optional methods meet the employer's needs, he may apply to the Wage Stabilization Board for a new plan. The Board's ruling will be made in the light of the employer's past practice and of relevant practices in the industry, occupation, and/or area, as may be appropriate.

The new Regulation involves other rules as well, which will be reported later in this department, as space permits.

Cement Output Increasing In Spanish, Portuguese Plants

Cement production capacity in Spain and Portugal is increasing according to latest information from U. S. Government sources. A plant at Figuera de Foz, Portugal, recently completed, raised the annual capacity to 700,000 metric tons which is said to be enough to meet the nation's domestic demands.

The firm of Carbones de Buga, S. A., was authorized to construct a cement plant at Fogols-las Minas, Province of Barcelona, Spain, and Cementos Ebro, D. R. C., Benifallet, Tarragona, was authorized to enlarge its existing plant.

A knockdown cement plant purchased in Belgium is used to supply cement needed for a hydro-electric project located near Pont de Suert. The plant has a capacity of 250 metric tons daily, and is operated by using local lignites for fuel.

Natl. Safety Council Issues Second Edition of Manual

Practical ways to prevent industrial accidents and fires are contained in the new edition of the National Safety Council's 800-page publication, *Accident Prevention Manual for Industrial Operations.*

Popular response to the first edition, issued four years ago, was so great that work was begun immediately on an expanded second edition. Just off the press, it contains 256 additional pages and 11 more sections than the first.

The book is confined principally to safety in the manufacturing industry, and is based on the premise that a major proportion of all accident causes are common to all industry.

Subjects covered include permanent structure and plant layout; maintenance and maintenance crews; machine guards; materials-handling hazards; hand and portable power tools; personal protective equipment; industrial health engineering; safety organization and training; accident records; and many others.

Detailed description and price may be obtained by writing the National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill.

The A. G. Sherwood Construction Co., a dealer in crushed rock, has located in Bartlesville, Okla., with Tom King as manager. The plant is equipped to process 500 tons of gravel per day.

Continental Sulphur Company, Dallas, Tex., recently informed stockholders of its activities in Wyoming by means of a film shown at a luncheon.

(From page 91)

Construction at Dummar, just outside of Damascus. This plant has two kilns of 100- and 150-ton capacity. A third kiln, nearly completed, will have a capacity of about 300 metric tons daily. This kiln was supplied by the Miag Vertrielbesgesellschaft m.b.h. Company of Braunschweig, Western Germany.

In December, 1949, construction was begun on a new wet-process plant for "Al-Chahba" *Societe Anonyme pour la Fabrication du Ciment et des Materiaux de Construction* at Aleppo. When completed in 1951, this plant will have a capacity of about 200 tons daily. Equipment for this plant is being supplied by the Polysius Corp. of Western Germany.

THAILAND

The *Thai Cement Company, Ltd.*, with wet-process plants at Bangsue, near Bangkok, and at Taluang, has a production monopoly in Thailand. The latter plant produces only cement clinker, which is ground at the Bangsue plant along with its own clinker output. Production during 1949 was about 10,000 metric tons per month, slightly under the demand. New equipment has been ordered to increase the capacity to about 12,000 tons per month. Each plant has its own power plant and the rotary kilns have recently been converted to oil firing.

PART V — AUSTRALIA

AUSTRALIA

The output of cement in Australia was 1,083,000 long tons for the 1948-49 fiscal year, a slight increase over the preceding year. The 1949-50 output was about 1,300,000 tons, and expansions in the industry are expected to raise this to about 2,000,000 tons. Most of the added capacity will come from three new plants. One, operated by the *Metropolitan Cement Co. Ltd.*, at Picton, New South Wales, is now in operation. This is the Ford Motor Co. plant, which was shipped almost intact from Detroit. The *North Australian Cement Co. Ltd.* is building a plant at Townsville, Queensland. This is being designed and built by the *Queensland Cement and Lime Co. Ltd.*, of Brisbane, Queensland.

South Australian Portland Cement Co., Ltd. This firm, with headquarters in Adelaide, Australia, has near completion a new wet-process cement plant at Angaston, South Australia, 50 miles from Adelaide. This will have an initial capacity of 500,000 bbl. per year, which will be increased to 850,000 when a kiln now operated at Brighton, South Australia, is transferred.

The raw materials are high- and low-grade limestones, loaded by a 1-cu. yd. Marion electric shovel and several D4 Traxcavators into 7-ton International trucks. A jaw crusher and a hammermill reduce the stone before it goes into storage. An F. L. Smidth 30-in. steel band conveyor carries the stone to the raw mill feed bins. The slurry from the 7½- by 40-ft. Vickers mill is pumped to four 500-ton slurry silos, and the blended slurry goes to a 60-ft.-dia. storage basin.

The 9½- by 275-ft. Smidth kiln has a Folax air-quenching cooler and is coal-fired by a Unax mill. Before going to the 200-ft. stack, the flue gases pass through a Lodge Cottrell Electrofilter, an important feature as the plant is in a vineland area.

Australian Cement Limited This Melbourne company has for some years operated a wet-process cement plant at Fyansford, Geelong, Victoria, with a capacity of 250,000 tons annually. A recent expansion program increased this by 60,000 tons annually, and the design of the plant is such as to allow almost unlimited future expansion. This program included the replacement of 100-ft. sections of the three 10- by 400-ft. kilns by enlarged burning zones 11½-ft. in dia. The original coal-drying and grinding system was also replaced by unit pulverizers for each kiln, and an additional raw-grinding mill was installed. The company produces its own power with two 3,000-kw. turbo-alternators.

The deposit at this plant is unusual. It consists of unconsolidated shell and coral, overlaid with clay overburden. Enough of the clay is removed so that the balance, with the limestone, gives approximately the desired mix. The quarry has a 150-ft. face, and its floor is about 100 ft. below sea level. Large steam locomotives of the articulated type, similar to those used in many parts of the world for mainline mountain railways, haul cars with 150 tons of rock and clay to the plant level through a 4,376-ft. concrete-lined tunnel up a 1:36 grade. Drainage pits and a pumping station keep the quarry dry.

Goliath Portland Cement Company Limited Goliath operates a plant at Railton, Tasmania, with a normal production capacity of 85,000 tons obtained from a single F. L. Smidth 10- by 8- by 164-ft. kiln, to which a Miag Calcinator was added in 1936. Additional emergency production is obtainable from an earlier small kiln and mills.

The works are alongside the limestone quarry, stone being handled by 2¼-cu. yd. Ruston Bucyrus shovel and 12-ton Leyland motor trucks, which are taken up a 1:6 grade by an automatically-operated barney car haulage system. Crushing is by means of a 36- by 42-in. Traylor jaw crusher and an F. L. Smidth hammermill.

Clay overburden from the quarry is used in the raw mix, with a small addition of iron ore mined a few miles distant from the plant.

Raw and clinker grinding mills are each 7 ft. 3 in. by 36 ft., absorbing 600 hp. Two classes of cement are produced, a normal portland cement and a modified low-heat cement, the latter being used by the State Hydro-Electric system in dam construction. In addition to two existing Bates packers, a Darnley Taylor (English) packer was recently installed, with provision for either rail or road delivery.

Approximately 75 percent of the output is consumed in Tasmania, the balance being shipped to the mainland of Australia, when existing production capacity cannot be fully employed owing to a shortage of coal. In addition to cement manufacture, the company operates a small asbestos-cement plant to cater to Tasmanian requirements, cement being supplied to the asbestos-cement factory by pipeline.

NETHERLANDS INDIES

No recent reports have been received on conditions in the Netherlands Indies, but in the latter part of 1947 the portland cement plant of *N. V. Nederlands Indische Portland Cement*, Maatschappij, Padang, Sumatra, the only plant in that country, was on its way to regaining its pre-war capacity of 240,000 metric tons monthly. Although bombed by the Allies in 1944, the plant was not seriously damaged, and one of its 394-ft. kilns was in operation in November, 1947.

Northwest Magnesite Company, Chewelah, Wash., has completed a number of improvements during the past year. One of these is the installation of a Joy Champion 58 rotary drill. Another is the installation of a raw mill at the quarry. Other improvements include a tram discharge terminal and a dust precipitation plant.

personal mention

R. H. Blackman, idustrial relations superintendent for the Potash Company of America, Carlsbad, N. M., has been named head of the newly-created industrial relations department of the firm. In addition to continuing his duties as resident counsel, Mr. Blackman will supervise the new department, which covers personnel activities, company publications, company-sponsored insurance programs, and employee and public relations.

G. A. Mattison Jr., president and general manager of the Woodstock Slag Corporation, Birmingham, Ala., and a past president of the National Slag Association, was recently elected to the Shrine Imperial Council at the 77th North American session of the Shrine meeting in New York City.

The appointment of Edward J. Nunan as New York State sales manager and materials engineer of the Buffalo Slag Co. Inc., Federal Crushed Stone Corporation, and Hornell Gravel Corporation was announced recently. They are affiliated companies with headquarters in Ellicott Square, Buffalo.

Frederick R. Schultz was placed in charge of railroad sales, in addition to serving as traffic manager. Robert H. Rosche was named assistant sales manager. Henry F. Rath of Erie, formerly sales representative, was promoted to sales manager for the Pennsylvania area.

The changes in the organization's sales setup resulted from the death of Carlton S. Wicker early this year. Mr. Wicker was in charge of the organization's sales in New York and Pennsylvania.

Mr. Nunan has been with the organization for about 20 years. He formerly was sales engineer. Mr. Rosche formerly was assistant to Mr. Wicker.

William H. Pulley, manager of the Atlanta, Ga., office of the National Gypsum Company has been made divisional manager of the newly formed southeastern sales division of the company which will include the Atlanta and Charlotte districts.

William Erwin, manager of industrial relations for the Marquette Cement Manufacturing Company, presented a paper at the annual spring meeting of the Portland Cement Association in Montreal, Canada on June 4. His talk was entitled *Falls of Men—Analysis and Recommendations.*

Texas Gulf Sulphur Company has announced the following changes in management: Walter H. Aldrich, president for 32 years, was elected chairman; Fred M. Nelson, executive vice-president of a Mexican subsidiary, becomes president; Thomas S. Lamont, vice-president, was elected chairman of the executive committe.

Gordon N. Scott, president of the Pioneer Sand and Gravel Company of Seattle, Wash., was recently named a vice-chairman for the Seattle-King County Community Chest Council's fund-raising campaign this fall.

Marquette Cement Manufacturing Company of Chicago, Ill., has, through its board of directors, elected Paul Duncan as assistant secretary and treasurer of the company. He has been with the firm since 1933.

OSGOOD

Air Cushion Clutch with Air Control
Smooths Out the Rough Jobs — Cuts Costs

Unequalled ability to absorb shocks and give smooth, fast, cost-cutting performance is winning OSGOOD machines the enthusiastic praise of leading engineers and contractors from coast to coast. And a major reason for the outstanding performance of OSGOOD machines is the OSGOOD Air Cushion Clutch with Air Control—the greatest advancement in power shovel design in the past quarter century.

This dependable, trouble-free clutch (with only one moving part) completely eliminates jerking and grabbing . . . provides fast, velvet-smooth action that permits accurate control of loads and reduces wear on both men and machines. By automatically compensating for the gradual wear on clutch linings, the OSGOOD clutch eliminates the many daily time-consuming adjustments necessary on other makes of machines. Be sure to see OSGOOD before you buy.

EQUIPMENT DESIGNED WITH YOUR JOB IN MIND

The OSGOOD COMPANY
MARION, OHIO
AFFILIATED WITH THE GENERAL EXCAVATOR CO.

POWER SHOVELS, CRANES
DRAGLINES, CLAMSHELLS
PILE DRIVERS & BACK HOES
CRAWLERS & MOBILECRANES
DIESEL, GASOLINE OR
ELECTRIC POWERED
CAPACITIES ⅛ TO 2½ CU. YDS.

obituaries

DONALD K. JOHNSON, 29, died on July 18 at Berne, Ind., of injuries received when he was thrown or fell from a bulldozer at the Erie Stone Company's quarry near Bluffton, Ind. There were no witnesses of the accident.

FRANK ROBINSON, who had been employed for 25 years by the Kosmos Portland Cement Company at Kosmosdale, Ky., died on July 22 at a hospital in Louisville. He was 64 years old.

CHARLES P. BENNER, assistant director of safety and welfare for the Lehigh Portland Cement Company until 1946, died on June 4 at his home. He had been ill for the last year. Mr. Benner was safety inspector from 1920 until 1942, when he became assistant director of safety and welfare.

JOHN L. ROE, chairman of the board of the Cummer Lime and Manufacturing Company, Jacksonville, Fla., died in that city on August 6. He was 76 years old. In his earlier years Mr. Roe was associated with the General Electric Company and the Florida Electric Company. He was at the time of his death a director of the Cummer Sons Cypress Company and president of the Southern Cypress Manufacturers Association.

LLOYD G. HENRY, secretary and treasurer of the Giant Portland Cement Company, Philadelphia, Pa., died on August 6 at his home in that city. He was 62 years old. Mr. Henry joined the company in 1917 at Norfolk, Va. He was a director of the firm and of a subsidiary, the Carolina Giant Cement Company.

WILBUR JUDSON of Newgulf, Tex., senior vice-president and a director of the Texas Gulf Sulphur Company, New York, N. Y., died in a hospital in New York on August 9 after a brief illness. Mr. Judson was also a vice-president and a director of the Sulphur Export Corporation.

BLYNN SIDELINGER, who had completed ten years as a sales representative for the Lawrence Portland Cement Company, died on April 4 at his home in Middleboro, Mass.

ROBERT BOLL, 19 years old, was the victim of a fatal accident at the plant of the Minnesota Sand and Gravel Company's plant at St. Louis Park, Minn., where he was employed. The tragedy was not witnessed by fellow workers, who reported that the victim apparently fell into a big gravel hopper and was suffocated before the accident was discovered.

DALE L. ROBERTS died recently as the result of injuries suffered in an accident. He was driving a truck loaded with 12 tons of crushed stone belonging to his employers, the Carl J. Longardner Stone & Gravel Company near Fort Wayne, Ind., which he turned into a road roller to avoid striking a passenger car. Mr. Roberts was thrown from the cab and suffered a brain concussion and other injuries which proved fatal.

CHESTER A. FULTON, 67, a mining engineer and a former president of the Southern Phosphate Corporation and of the American Institute of Mining and Metallurgical Engineers, died on August 16 at his home in Baltimore, Md. Early in his mining career Mr. Fulton served various firms having operations in Mexico, Venezuela, Cuba, and Central America. He became manager of the Davison Sulphur Company at Cienfuegos, Cuba, in 1918, and from 1921 to 1928 he was a consulting engineer to the Davison Chemical Company at Baltimore. He served first as vice-president and later as president of the Southern Phosphate Corp., retiring in 1945.

PIONEERS and LEADERS IN DUST CONTROL

Continuous Sly Dust Filter on a Feldspar Plant in Maine

Sly Dust Filter in a Rock Crushing Plant in Connecticut

SLY
Long Experience May Save You Thousands of Dollars

Many years of experience and numerous operating installations IN YOUR PARTICULAR INDUSTRY make Sly the outstanding organization to engineer your dust problem.

The know-how of dust collection cannot be found in print. It has been acquired by Sly through experience with thousands of installations for generations.

A note from you will bring you our text book bulletin or, if you wish, a Sly engineer to help lay out and specify suitable equipment.

Sly units are not expensive; they save thousands of dollars yearly in plant maintenance and improved production.

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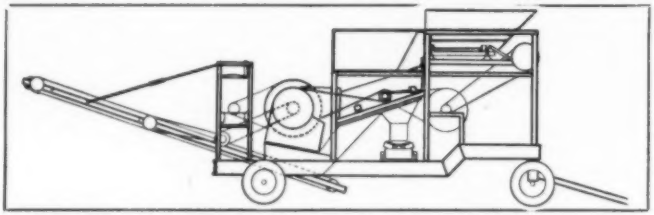
new machinery and supplies

PIT AND QUARRY



● Portable Gravel Plant

A single-pass gravel plant designed especially for the processing of gravel by highway departments or for processing gravel on small jobs requiring frequent moving is being made by the Diamond Iron Works, 18th avenue No. and 2nd street, Minneapolis 11, Minn. Capacities, based on 25 percent oversize passing a 1-in. screen are approximately 24 t.p.h. for the No. 116 plant, 60 t.p.h. for the No. 120, and 65 t.p.h. for the No. 124 plant.

Oversize material is crushed by a roller bearing jaw crusher and fed into the screened material, which is then conveyed to the trucks or stockpile.

● Industrial Furnace

Temperatures up to 2,000 degrees and output of 600,000 to 100,000,000 B.T.U.s achieved with direct-fired hot gas generating "AgiTair" industrial furnaces.

These furnaces are custom-built in either vertical or horizontal styles to fit the available space. Burners are designed for fuel oil or gas or combination of the two, with manual or automatic controls. The discharge temperature of the gases is automatically controlled by the firing rate and other controls.

High efficiency is claimed for these furnaces, as there are no stack losses. The products of combustion are clean gases.

The design of the furnace utilizes the flow of air being heated to cool the furnace casing and to remove the heat from the refractory walls of the combustion chamber. Insulation of the unit is thus avoided and all the heat is used. These furnaces are used for drying slurry, rock, clay, limestone, and many other materials and for preheating service. AgiTair furnaces are a product of Air Devices, Inc., 17 East 42nd street, New York 17, N. Y.

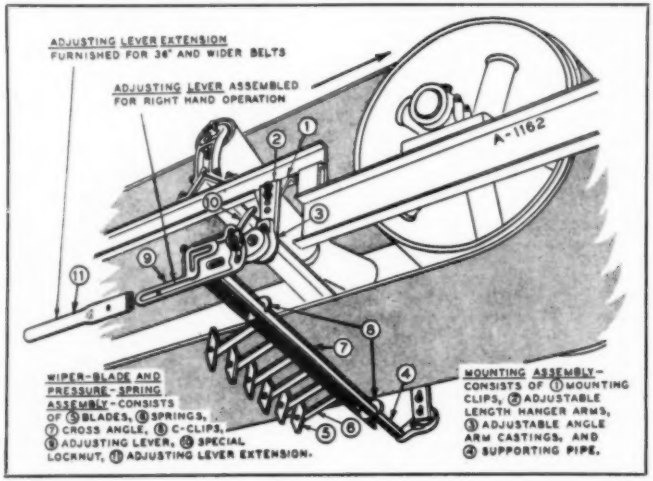
● Spring-Type Belt Cleaner

The S-A spring-type belt cleaner is said to clean wet, sticky, or dry material from conveyor belts without injury to the belt. Use of the cleaner prevents material from dribbling off along the return run of the belt causing unsightly conditions and getting in the return idler bearings.

The device consists of a series of spring steel wiper blades that are held perpendicular to the surface of the belt but diagonally to the travel. This wipes the belt clean and dry as it passes. The spring steel arms holding the blades allow them to ride over splices without injury. Material from the cleaner falls directly into the rear of the discharge chute.

The cleaner has an independent mounting that can be adapted to a variety of mounting positions. Adjustments and blade replacements can be made from either side of the conveyor without interrupting operation.

The S-A conveyor belt cleaner is made by the Stephens-Adamson Manufacturing Company, Aurora, Ill.


ADJUSTING LEVER EXTENSION FURNISHED FOR 36" AND WIDER BELTS
ADJUSTING LEVER ASSEMBLED FOR RIGHT HAND OPERATION
A-1162
WIPER-BLADE AND PRESSURE-SPRING ASSEMBLY-CONSISTS OF (5) BLADES, (6) SPRINGS, (7) CROSS ANGLE, (8) C-CLIPS, (9) ADJUSTING LEVER, (10) SPECIAL LOCKNUT, (11) ADJUSTING LEVER EXTENSION.
MOUNTING ASSEMBLY-CONSISTS OF (1) MOUNTING CLIPS, (2) ADJUSTABLE LENGTH HANGER ARMS, (3) ADJUSTABLE ANGLE ARM CASTINGS, AND (4) SUPPORTING PIPE.

B.F.Goodrich

Pick your toughest hauling job—hand it to these tires

ROSCOE KREAGER, Supt., right above, watches a loading operation at the quarry of the Woodville Lime Products Company at Woodville, Ohio. Here, Mr. Kreager sees a giant crane dump a bucket of limestone into a trailer equipped with B. F. Goodrich Universals. This is a year-round operation at Woodville as the company processes limestone, fertilizers and other kindred products for nation-wide sales.

Some thirty vehicles are used by this company for intraplant stone hauling. According to Kreager, BFG Universals are used on all of these vehicles, and the company is well pleased with the performance of the B. F. Goodrich tires on these vehicles. Subjected to exceptionally hard wear, they travel over stone and razor-sharp rocks with equal traction in forward or reverse gears because they are nondirectional!

B. F. Goodrich Universal tires were selected on the basis of service and quality. These tires have greater bruise resistance and greater ability to absorb and withstand shocks because they're built with the patented *nylon shock shield*. Strong, protective layers of nylon are built in between the tread rubber and the cord body of all BFG tires of 8 or more plies . . . and at no additional cost to you.

There's a special B. F. Goodrich tire for every off-the-road service. See your local dealer. Let him help you get the benefits of longer tire life and lower operating overhead. *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

USE HEWITT-ROBINS BELT AND BUCKET ELEVATORS

Handle more for less—buy your bucket elevators equipped with *load-matched belting.*

No one type of elevator belting is best for all needs. When engineered *for* the job, it stays *on* the job. Hewitt-Robins proved this in grueling laboratory tests and on-the-spot field studies. That's why so many pit, quarry and plant operators come back year after year for Hewitt-Robins Elevator Belting.

Users know Hewitt-Robins Belting gives long, low-cost service—moves more tonnage for less. They know it wards off the punishing pull of bucket bolts . . . abrasion caused by lumps caught between boot pulley and belt . . . wear from belt slippage . . . deteriorating effects of mildew—every other abuse of day-to-day service.

You name the material—sand, gravel, slag, crushed stone, gypsum, aggregates, cement—hot or cold, wet or dry . . . there's Hewitt-Robins Elevator Belting *to match the load.* For jobs where only the best is tough enough—heavy-duty Maltese Cross® and Monarch®. For lighter, more general service—durable Ajax® and Conservo®. All four are available with or without covers. Ask your nearby Hewitt Rubber Distributor for recommendations. See your classified phone book or write to Hewitt Rubber Division, 240 Kensington Ave., Buffalo 5, N. Y.

—And if you need a new Belt and Bucket Elevator, get the best—choose from 58 standard types, styles and sizes. Write for Bulletin No. 151. Address Robins Conveyors Division, Hewitt-Robins Inc., 240 Passaic Ave., Passaic, N. J.

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

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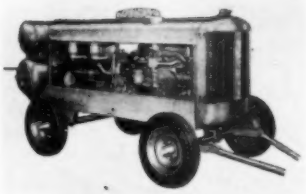
BELT CONVEYORS *(belting and machinery)* • BELT AND BUCKET ELEVATORS
CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS
FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS
RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS
TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS



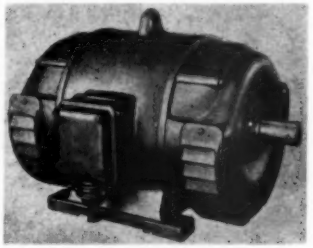
● Single-Stage Compressor

A 210-cu. ft. single-stage compressor has been added to the Schramm line. The "Unistage" is designed for economical and continuous performance.

The machine features a six-cylinder engine and a six-cylinder compressor with about 90 percent of the engine and compressor parts interchangeable. The single-stage feature eliminates the problems of two-staging and the use of an inter-cooler. Other points of the new model include electric starting, speed control, cam operated intake valves, and dual fan belts.

● Quick Stopping Motor

A combination brake and drive all-in-one unit is the new "Quick Stop" motor of the Brown-Boveri Corp., 19 Rector St., New York 6, N. Y. This



motor is especially designed for use as original equipment or replacement where frequent starts and stops are necessary, as hoists, cranes, etc. The brake operates automatically when the power is stopped with 150 percent of the normal torque. There is no creep or backlash.

Mounting may be either horizontal or vertical for forward or reversing service. They are available in .3 to 8 hp. drip-proof, and .2 to 4 hp. totally enclosed models.

● Rear Dump Trucks

Two new models of rear-dump trucks have been announced by the Euclid Road Machinery Company, Cleveland 17, O.

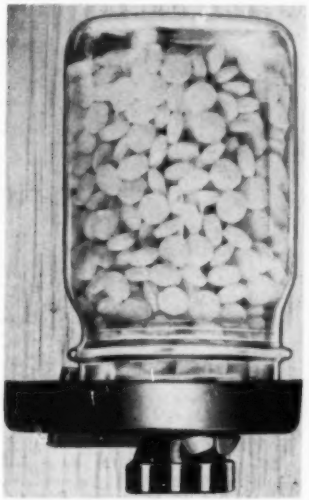
The trucks are rated at 30,000 lb. payload capacity or 9.7 cu. yd. standard body and 11.1 cu. yd. quarry body, struck measure. The Model "82FD" is powered by a two-cycle GMC Series 6.71 diesel engine developing 190 hp. and weighing 2,180 lb.

The Model "80FD" is powered by a Cummins four-cycle diesel Model HRB-600, which develops 165 hp. Engine weight is 2,425 lb. Other than the slight differences made necessary by the engines, the trucks are identical.

● Salt Dispenser

Heat fatigue, languidness, and heat prostration may be prevented by placing a handy supply of salt tablets near drinking fountains.

Summer weather as well as heat from kilns, driers, and other equipment is responsible for many summer ailments based on loss of salt from the body by excessive sweating. A new visible, handy



dispenser of glass and plastic reminds workers of the need for salt and aids in preventing lost time from heat. The container holds 750 tablets and is easily installed near drinking water fountains. It is made by the General Scientific Equipment Co., 2700 W. Huntington St., Philadelphia 32, Pa.

● Hoist-Binder

Small hoisting operations such as machinery repairing or load binding may be easily done with the Coffing Hoist-Binder made by the Coffing Hoist Company, 800 Walter St., Danville, Ill.

This device operates on a ratchet principle, so that the chain may be taken up or slackened off in any amount up to the total length of the chain. The entire operation of the hoist is controlled by the handle, both in taking up and slacking off. Removing the handle locks the hoist.

Dangerous overloading is impossible because the handle will bend before severe overloads occur. The hoist is rated for a 3,000-lb. pull.

2 ways to make sure of BETTER, CHEAPER GRINDING

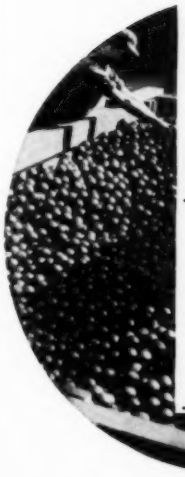
...use U·S·S LORAIN ROLLED PLATE LININGS

● U·S·S Lorain Rolled Plate Linings are easy to install . . . hard to wear out. Made to accurate size and in easy-to-handle sections, they save hours of installation time . . . keep mill down-time to a minimum. And because they're made of tough, rolled steel, they can be kept in service until they're paper thin.

With U·S·S Lorain Rolled Plate Linings you get *all* the life that's in them. The plates are interchangeable, so that localized wear at feed or discharge ends may be balanced by shifting plates to opposite mill end, resulting in longer life—lower grinding costs.

Rugged U·S·S Lorain Rolled Plate Linings are available through leading mill manufacturers whose names will be furnished upon request.

...use U·S·S GRINDING BALLS



Quality U·S·S Grinding Balls are forged from special analysis steel and accurately heat-treated to take the punishment of long, heavy runs. There's a size for every grinding need (available in diameters from ¾" to 5").

For further information about durable U·S·S Grinding Balls, send for our FREE booklet. Just return the coupon below.

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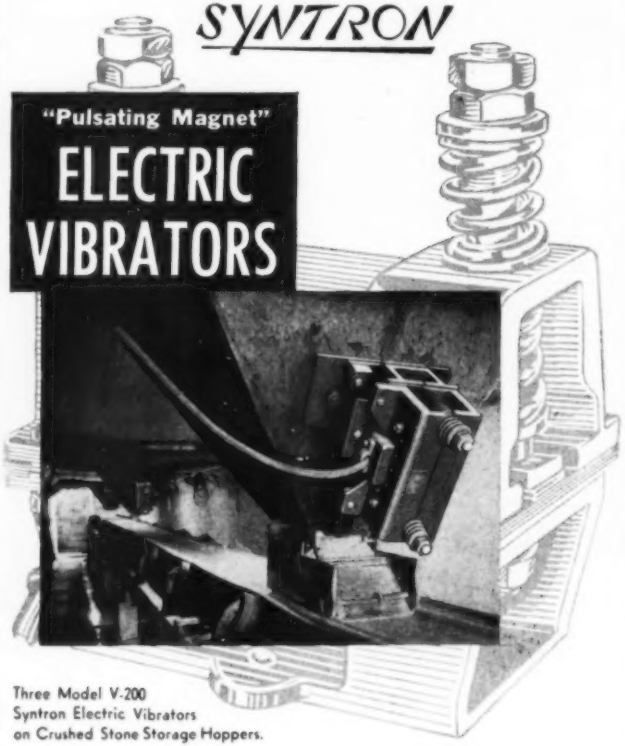
SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS



Three Model V-200 Syntron Electric Vibrators on Crushed Stone Storage Hoppers.

For smoother material flow with no unscheduled stoppages due to material arching and plugging in bins, hoppers and chutes . . . apply Syntron Electric Vibrators.

The right size Syntron Vibrator properly applied sets up a flow of high speed vibrations (3600 vib. per min.) that will cause the most stubborn and difficult material to flow freely, and that will move tons of inert weight.

Syntron Electric Vibrators will save their cost by eliminating damage to equipment by sledging and rodding . . . cutting down replacement costs.

The Vibrators are widely used on storage bins, hoppers and chutes for flowing materials ranging from fine powder to large chunks. Available in a variety of sizes . . . small models for little hoppers and large heavy-duty models for big bins and bunkers. Also available in a complete line of semi-noiseless models.

APPLICATIONS

Conical or Rectangular Hoppers

Parabolic Hoppers

Flat Bottom Bin with Center Discharge

Wooden Hoppers

Concrete Hoppers

Inclined Chutes

Hopper with Sloping Discharge

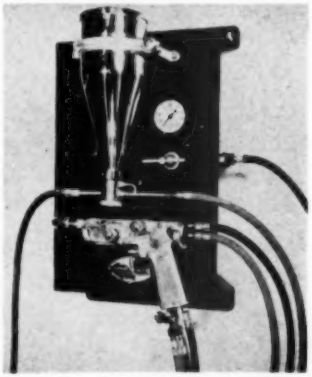
SYNTRON COMPANY

385 Carson Avenue Homer City, Penna.

● Metallizing Unit

A new model "Spraywelder" has been announced by the Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich. The new model is designed to apply hard-facing alloys using metallizing procedures and to handle metal powder castings.

Among the new features are: lighter



weight, larger capacity air filter, finger-tip control trigger with lock, increased cooling chamber, locked feed mechanism, improved valves, and eye-level mounting of gauge and regulator.

● Winch

The Carco "G" winch features concealed cable controls, a toggle-type brake, and a choice of standard or slow speed gears. It is a heavy-duty winch that has been streamlined for greater efficiency. Exterior nuts and bolts are recessed. Drum flanges are shrouded to minimize cable damage.

Flexible controls leaves the fenders of the tractor and the winch case free of obstructions. The toggle-type brake is self-energizing and gives increased leverage that permits inch-by-inch lowering of the load. Provision is made for bolting a Carco fairlead directly to the "G" winch without welding or burning.

Carco products are manufactured by the Pacific Car and Foundry Company, Renton, Wash.

● Cold-Mix Binder

A long-lasting road material that may be applied in any weather has been announced by the Koppers Tar Products Division, Koppers Company, Pittsburgh 19, Pa.

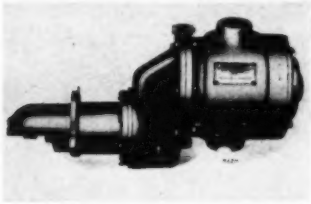
The new material, "Komac," is produced by cold mixing in any type of mixing equipment. It can be stockpiled and moved at any time in any kind of weather — even at temperatures near zero. Tamping or rolling is all that is required to put the material in place, and it is ready for traffic immediately after being placed. Resistance to bleeding in hot weather is very good, and the material is highly resistant to skidding.

Binders for the material are produced at Chicago, Ill., and Utica, N. Y., with additional facilities planned for next year. This material is now being marketed after two years of testing under all weather conditions.

● Air Starting Motors

Starting motors for gasoline and diesel engines powered by compressed air have been announced by Ingersoll-Rand Company, 11 Broadway, New York 4, N. Y.

These air motors eliminate the need for generators and batteries and their attendant maintenance. Climatic conditions that sometimes injure electrical



motor windings have no effect on the air starters.

The air starting motor consists of a multi-vane air motor that cranks the engine through a Bendix drive designed for it. The motor consists of a hardened steel, 5-vane rotor revolving in an alloy, wear-resistant cylinder enclosed by bronze end plates. Ball and roller bearings are used to support all rotating parts.

There are two sizes, the "9BM," which develops up to 16 hp. and requires about 7 cu. ft. of air per start, and the "20BM," which develops up to 41 hp. and requires about 16 cu. ft. of air per start.

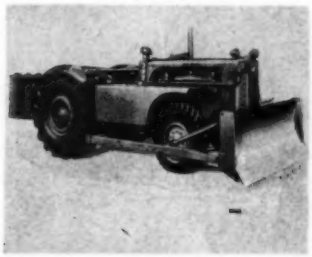
● Bulldozer

A straight blade bulldozer, the "No. 10S" is being manufactured by the Caterpillar Tractor Company for use with the "DW10" line of tractors.

The bulldozer attachment includes the blade, push arms, braces, hitch, sheave support and heavy-duty radiator guard, and combination cable and sheave group.

The trunnions for the bulldozer are included in a weight box and frame assembly designed for wheeled tractors. The assembly mounts on the tractor frame and supports the bulldozer trunnions. It also includes a heavy box at the rear of the tractor to accommodate counterweights. The four counterweights are offered separately. They weigh 7,000 lb. and give increased traction on the driving wheels. A towing hitch is part of the counterweight box so that towing is possible with the assembly.

The standard No. 21 cable control is used with the bulldozer. All are products of the Caterpillar Tractor Company, Peoria, Ill.



SPECIFIED FOR THE JOB!

J-M INDUSTRIAL FRICTION MATERIALS

are designed to take a beating—that's why they're specified by manufacturers who build earth-moving equipment that lasts!

SPECIFIED ON THE JOB!

Men who operate bulldozers—cats—shovels—know they can get the tough jobs done when they're running machines equipped with J-M INDUSTRIAL FRICTION MATERIALS

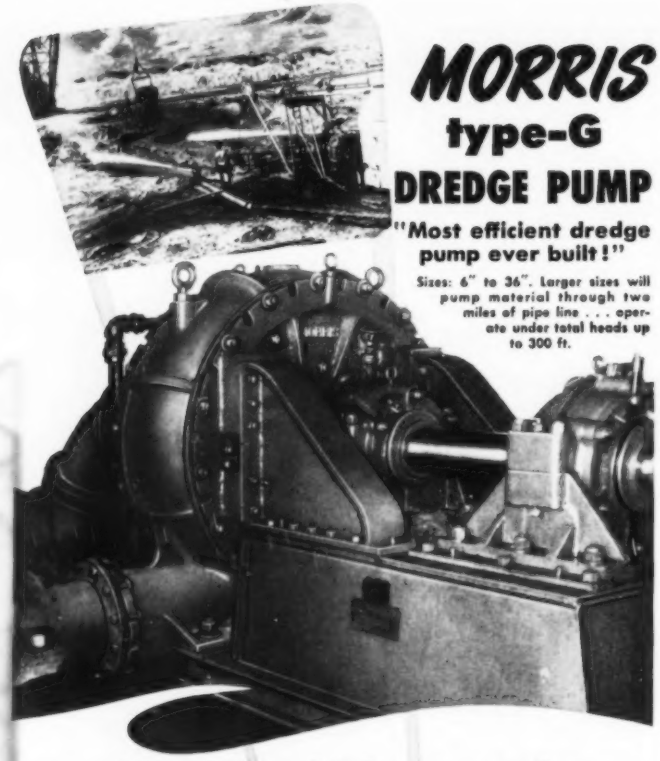
● Digging a canal—stripping a mine—cutting a road—Johns-Manville Friction Materials move more tons of earth than any other industrial brake or clutch frictions. That's because they've built a reputation for handling bigger loads at high speeds—*at lower cost!* Send for your copy of "Johns-Manville Industrial Friction Materials" that tells how these materials combine maximum operational efficiency with long life and low-cost maintenance. Write Johns-Manville, New York 16, N. Y.

JM

Johns-Manville

INDUSTRIAL FRICTION MATERIALS

No. 1 With Leading Manufacturers



MORRIS type-G DREDGE PUMP

"Most efficient dredge pump ever built!"

Sizes: 6" to 36". Larger sizes will pump material through two miles of pipe line . . . operate under total heads up to 300 ft.

Long life under high output due to efficient design and construction

Specially designed bearings—Stand up under all loads, hydraulic or mechanical, encountered in severest types of dredging work. Anti-friction, self-aligning roller bearings on sizes 6" to 16" —heavy Kingbury bearings for pumps above 16".

Patented pressure balanced impeller—Lasts longer—all parts wear evenly. Shroud on suction side is larger in diameter —balances casing pressure, decreases wear.

Other superior Morris features—Volute-type casing. Interchangeable liners on hub and suction sides. Easily accessible stuffing box. Vibration-free, extra-large, high-grade steel shaft removable through suction side of casing.

The experience of 87 years in the designing and building of pumps is at your disposal. Let our engineers help you select the exactly right pump for your particular needs. No charge or obligation.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.

MORRIS *Centrifugal Pumps*

Branch Offices in Principal Cities

● Dry-Type Transformer

Savings in copper, steel, space, and weight are the features claimed for the new general-purpose dry-type transformers of the General Electric Company, Schenectady, N. Y.

These transformers use a Class B insulation instead of Class A. Class B insulation can stand higher temperatures in the copper windings. This feature and an improved grain-oriented silicon steel core makes possible the use of less copper and steel to achieve an average weight reduction of 30 percent in the line.

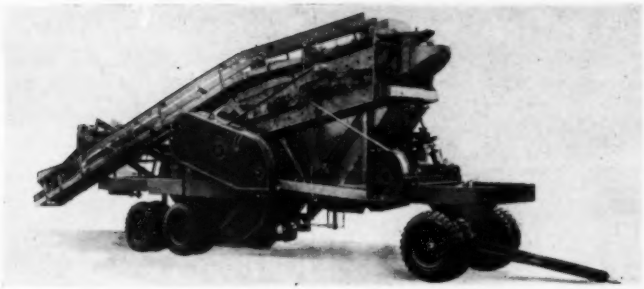
These transformers are being made in single-phase, 60-cycle current models of 3 kv.-a. and upwards. They will be available for boosting and bucking applications, general light and power service, autotransformers for general service, and 32-volt applications.

The redesigning of the transformers was undertaken to furnish the maximum number of transformers from the available supply of critical materials. The illustration (Class A at the left, Class B at the right) shows the difference in volume.

● Portable Spreader

Sand, gravel, cinders, chips, and similar material in road repair and maintenance work may be spread easily from the truck by means of the Model "DD" spreader, made by the Highway Equipment Company, Cedar Rapids, Iowa. This spreader clamps on the tail gate of a truck and is easily changed from one truck to another in a few minutes.

The device consists of a disc with fins for throwing the material, which is fed from a hopper. The distributor disc is driven by an air-cooled motor which is a part of the unit. Up to 60 ft. of width can be covered in one trip. The unit is said to be well adapted for spreading seal coat or anti-skid materials.



● Duplex Gravel Plant

A portable duplex gravel plant designed especially for use in areas of restricted highway load limits where high production of aggregates is required has been announced by the Pioneer Engineering Works, Minneapolis 13, Minn.

The plant is equipped with a jaw crusher and a 24-by 16-in. double roll crusher. A 3- by 10-ft. 3½ deck vibrating screen provides 60 sq. ft. of screening area. The plant is fed with a swivel type field conveyor equipped with a 24-in. reciprocating plate feeder while the sized material is delivered by a 24-in. by 25-ft. channel frame conveyor. The model "24V" has a 10- by 24-in. jaw crusher, while the "25V" has a 10- by 36-in.

The plant is 12½ ft. in height and 40 ft. long. with a 21-ft. wheel base. Travel weight without power unit is 42,100 or 46,000 lb., depending on the crusher size. Three axles and 12 10.00 by 20 pneumatic tires carry the machine.

● Long-Life Battery

The Exide "Ultra Start" battery now being marketed has performed so well in tests that the company hesitates to predict its exact life span. However, it is expected to give considerably longer service.

The Ultra Start battery contains grids of Silvium—a metal containing lead, silver, and other components; a new

type of active material; a low-specific-gravity electrolyte; and Permax plastic separator. These and other innovations produce the longer life of the Ultra Start.

Experimentation on the new battery has been going on for a number of years and has reached a point where commercial production is being undertaken. Exide Batteries are made by the Electric Storage Battery Company, Philadelphia, Pa.

● Expendable Drill Bit

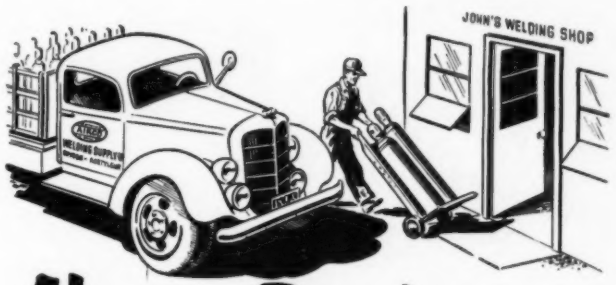
The DBT "Throwaway" bit is designed for single service use. When the edge has worn out, it is thrown away and another bit is used.

The bits are designed with blunt, hardened cutting edges that make large chips and with large air holes that minimize plugging.

The cutting edges have short parallel sides which reduce gauge loss. The edges are heat-treated to give hardness, while the skirt is treated to produce toughness.

The bits are not threaded or locked on. The sides of the socket are smooth and parallel, so that when the bit is placed on a drill rod it is gripped uniformly by the elastic metal of the skirt. Although held with a force of 20,000 lb., the bits are easily removed with a knock-off tool. The Throwaway bits are produced by the Drill Bit and Tool Company, Ninth and Bingham Streets, Pittsburgh, Pa.

Hibbard S. Greene, 69, died recently in Milwaukee, Wis. He has been vice-president of the Barber-Greene Company, Aurora, Ill., and assistant to the president of the Chain Belt Company, Milwaukee, Wis., before retiring.



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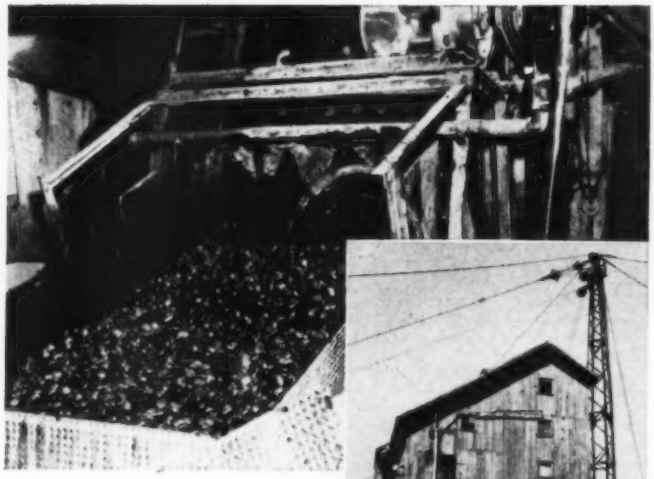
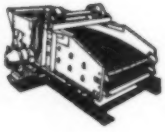


Screen cloth life is "very satisfactory" and so is the life of the Deister machines, reports owner of the Steiner Sand and Gravel plant, West Milton, Ohio. One Deister replaced an unsatisfactory unit of another make in 1944, and their second Deister replaced the original Deister which took daily punishment at the Steiner plant for 21 years.

21 YEARS CONTINUOUS OPERATION



That's right . . . it took 21 years daily punishment to wear out the original Deister Screen in the plant of the Steiner Sand and Gravel plant near West Milton, Ohio. That's why the Steiners, Walter J., and son, Richard, chose another Deister.

The Steiner plant utilizes two sizing screens—both Deisters—in this 650 tons per day capacity plant. Screens have to be good, to produce uniform results, because aggregate processed comes from three separate sources and varies widely. The 3 x 6 Deister 3-deck screen was bought in 1950 to replace a similar Deister which had been in continuous use since 1929. Their 4 x 10 4-deck Deister Screen was purchased in 1944 to replace one of another make that had been giving excessive bearing trouble.

Deister screens have long life and they give screen cloth long life. They belong in your plant. Get the facts from your Deister dealer—or write direct to the factory.

DEISTER SCREENS

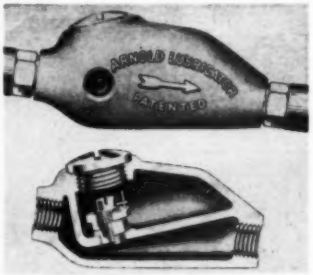
DEISTER MACHINE COMPANY

FORT WAYNE 4, INDIANA

● Air Line Lubricator

A ½-pint capacity oil lubricator for use in air lines to lubricate pneumatic tools is announced by the Rucker Company, 4228 Hollis Street, Oakland, Calif.

Featured on the new model "Arnold Lubricator" is a pressure-proof window



so that the oil level can be seen. An adjustable feeder regulates the amount of oil fed to the air. Made of lightweight alloy the device can be placed in the air line without creating drag, and its shape permits pulling it around corners.

● Ejecting Truck Box

Loads of 4 to 10 cu. yd. may be handled by the line of ejecting truck boxes made by the Wisconsin Foundry and Machine Company, 623 East Main Street, Madison, Wis.

The box consists of a bottomless steel

body mounted on side tracks. A winch-and-sheave arrangement causes the box to slide backwards along the tracks allowing the load to fall off the rear end of the truck bed. A retract cable brings the body back for reloading.

This method of dumping is said to keep the load in balance and the dumping height low, and to prevent sticking of wet loads.

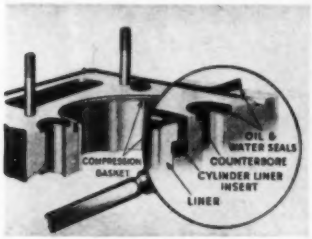
● Cylinder Block Seals

A revolutionary method of sealing the cylinder block and head on the General Motors Series 71 diesels has been announced. The new method eliminates the copper compression head gasket formerly used and replaces it with individual cylinder gaskets of laminated Terne plate which act as compression gaskets.

Oil and water passages and the edge of the block are sealed with individual

synthetic rubber seals which fit into grooves machined in the block and just drop into place. They are compressed when the head is bolted on.

Changes in the height of the block have been made to compensate for the



decreased space taken up by the new sealing method, so that all working parts and the compression ratio remain the same as with the older models in the Series 71.

A further change has been made in the angle of the discharge valve, from 45- to 30-degrees, so that less turbulence occurs in the exhaust gases and scavenging air. The block and head has been strengthened in the new design, and longer retaining screws have been used to hold the camshaft intermediate bearings.

Detroit Diesel Division, General Motors Corporation, Detroit 28, Mich., is the manufacturer of G. M. Diesels.

● Noiseless Vibrator

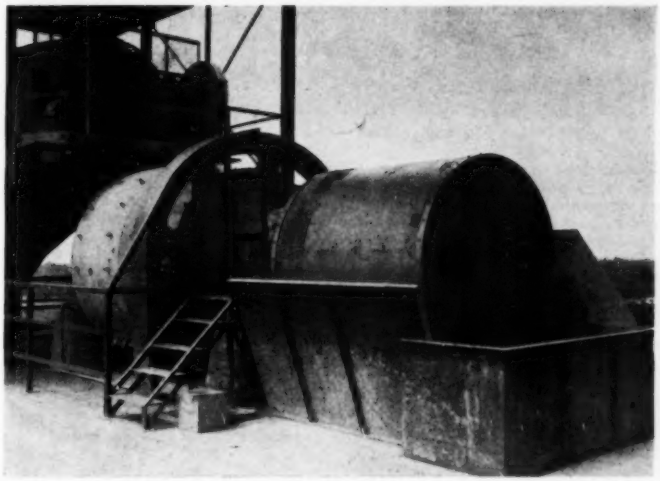
Noiseless vibration is the feature claimed in the new Type "AC" vibrator produced by the Cleveland Vibrator Company, 2710 Clinton Street, Cleveland, Ohio.

The vibrator achieves vibration without noise by using an air cushion at each

end of the reciprocating piston. Speed and intensity of vibration can be regulated as needed. This vibrator is said to be especially useful where noise is objectionable. The unit is 6½ in. long and 1½ in. wide. It weighs about 3 lb.

The Allen Sherman Hoff Pump Company has moved to a new office at 259 East Lancaster avenue, Wynnewood, Pa. The company formerly was located in Philadelphia.

HARDINGE SCRUBBER KEEPS QUARRY FROM BEING ABANDONED



Hardinge 8' x 48" Scrubber with 6' x 6' screen, removing clay from 60 to 80 tons per hour of minus 1½" material.

A west coast sand and gravel firm was faced with a quarry shut-down due to exhaustion of their high-grade deposit. Below the 12' level, extensive deposits of the excellent sand and gravel were present, but unfortunately clay strata ran through this entire lower section.

The problem then, in order to continue operation, was to find a suitable washing device to eliminate the clay, which when wet is very sticky and difficult to wash and process.

The solution was found in a Hardinge Conical Scrubber. The scrubber consists of a conical shell like that of the well-known Hardinge Conical Mill, discharging into a cylindrical dewatering screen which is fastened to the discharge end of the scrubber and rotates with it. Internal liners and special lifting flights create a turbulent "mass action" which is similar to the effect obtained by rubbing a handful of pebbles together between the palms in a bucket of water. The Hardinge Scrubber installed was an 8' diameter x 48" cylinder unit with a 6' x 6' dewatering screen.

About 30% to 33% of the total raw material entering the entire plant passes through the Hardinge Scrubber. Usual water requirements for a scrubber of this type are 2.5 to 3.0 G.P.M. per ton per hour of feed. Now in full operation, the Hardinge unit has fulfilled expectations in regard to quality of output, simplicity of operation, tonnage handled, mechanical aspects and its overall economy of operation. The sand and gravel as now processed in the new washing plant is making an excellent product, one that meets every federal, state and local specification.

HARDINGE
COMPANY, INCORPORATED
YORK, PENNSYLVANIA—240 Arch St. Main Office and Works
NEW YORK 17 • SAN FRANCISCO 11 • CHICAGO 6 • HIBBING, MINN. • TORONTO 1
122 E. 42nd St. 24 California St. 205 W. Wacker Dr. 2016 First Ave. 200 Bay St.

trade notes

New facilities to expand engine production capacity are being built by the Cummins Engine Company, Columbus, Ind. This expansion, which is the third in nine months, is designed to bring the increased plant capacity to more than 50 percent over the 1950 record level.

The new program is expected to cost about $6,000,000 and will match an equal sum that has been expended in the past five years. At present the company is operating a three-shift six-day week and needs increased facilities to meet the demand for engines. Additions to the research laboratories and facilities for dealer training are parts of the proposed project.

Consolidation of the Los Angeles and Oakland zones of GMC Truck and Coach Division under F. A. Hoyt was announced recently. This followed the retirements of Harry W. Howard, manager of the Pacific region of GMC, Oakland, Cal., after 29 years of continuous service with the company, and of J. W. David, GMC zone manager, Los Angeles, Cal., after 21 years of continuous service.

W. J. Fleming

The Worthington Pump and Machinery Corporation has appointed William J. Fleming manager of the construction equipment sales division, according to a recent announcement by W. H. Feldmann, vice-president. John S. Bachman will continue in charge of field sales with the title of assistant manager. Both men will continue to make the Dunellen Works, Dunellen, N. J., their headquarters.

Mr. Fleming has been identified with Worthington Construction Equipment Sales since 1934.

Two staff appointments at the Philadelphia Division, Yale & Towne Manufacturing Co., have been announced by Elmer F. Twyman, vice-president-in-charge.

N. R. Amberg

H. W. Wesenberg

Norman R. Amberg was appointed assistant works manager, and Harvey W. Wesenberg, supervisor of materials handling.

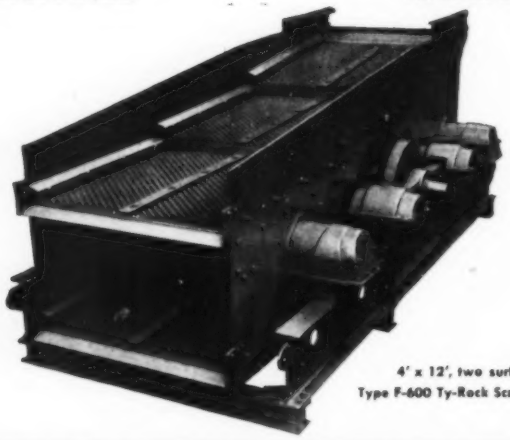
The installation of a new five-color press at the Canajoharie, N. Y., plant marks the completion of a $500,000 expansion program by Arkell & Smiths, bag manufacturers.

During the last nine months, increased printing capacity has been added to each plant. The multiwall bag plants at Mobile, Ala., Wellsburg, W. Va., and Canajoharie can print bags in from one to four colors and the specialty bag plant at Canajoharie, formerly limited to four colors, can now print up to five colors.

YOU CAN DEPEND ON

TY-ROCK SCREENS

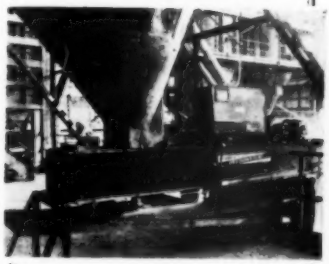
BALANCED RUGGED



4' x 12', two surface
Type F-600 Ty-Rock Screen

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

You're Sure with Merrick



FOR Positive Controlled Feed by Weight of Sand Gravel, Lime Clinker, Gypsum or other materials to Process—

Use the Feedoweight

Merrick Scale Mfg. Co.
Passaic, New Jersey

The board of directors of Laclede-Christy Company, fire-brick manufacturers with headquarters in Chicago, Ill., have announced the election of J. D. Street, formerly vice-president in charge of developments at the Granite City Steel Company in St. Louis, as president and treasurer. He succeeds D. N. Watkins, who resigned.

The board of directors also announced the election of A. B. Agnew as president of the Laclede-Christy Company of Pennsylvania, a subsidiary.

R. E. Huthsteiner

Robert E. Huthsteiner has been elected president of the Cummins Engine Co., Inc., of Columbus, Ind. Formerly the executive vice-president, Mr. Huthsteiner succeeds J. Irwin Miller, who becomes chairman of the board. Clessie L. Cummins, founder of the company and formerly chairman of the board, has been named honorary board chairman.

J. F. Dollison

James F. Dollison has joined the Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio as field engineer.

Mr. Dollison will headquarter in Youngstown, from where he will contact the industrial organizations of northeastern Ohio and western New York in the interest of Republic's line of industrial rubber products.

Ben K. Duffy has been appointed district sales manager for the Pittsburgh district of Plate and Welding division, General American Transportation Corporation.

Mr. Duffy formerly was a sales engineer. His district includes Ohio, West Virginia, Tennessee, and the adjacent parts of Pennsylvania and Kentucky.

Appointment of three new distributors for Nordberg 4FS four-cycle one- and two-cylinder diesel engines has been announced by Nordberg Manufacturing Company, Milwaukee, Wis.

The new distributors are: Houston Engine & Pump Co., 1939 St. Bernard St., Houston, Tex.; O'Keefe Motors Inc., 403-15 Samuel St., Trenton, N. J., and Midwest Utilities Power Equipment Corp., 1270 Augusta Blvd., Chicago, Ill.

The Timken Roller Bearing Company, Canton, Ohio has announced the following appointment: R. A. Schimpf to chief works engineer, H. J. Urbach to executive engineer; C. M. Maratta to chief consulting engineer, and L. A. Holder to chief mechanical engineer.

The Georator Corporation, Arlington, Va., has acquired the complete business of the Geophysical Instruments Company. The latter will become a division of the corporation and will continue to make the same products.

Construction of a new plant near Kansas City, Mo., for Fairbanks, Morse & Co., will be started at once by the Stone & Webster Engineering Corporation, it is announced by Robert H. Morse, Jr., President.

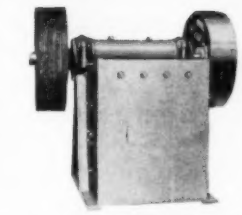
Originally planned as a scale plant, it has now been enlarged to approximately 500,000 sq. ft. of floor space, which includes a foundry, and is to be used to make engines and pumps.

The new plant will be a one-story structure and is to be constructed of brick and reinforced concrete. Including machinery and equipment, the cost is placed at $7,500,000. When in operation, it is expected there will be nearly 1,000 employees.

Scale manufacturing operations of the company, now at St. Johnsbury, Vt., and Moline, Ill., will be expanded, according to Mr. Morse.

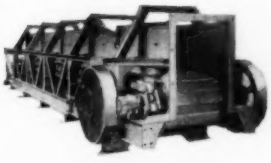
ROGERS

Balanced Crushing Equipment



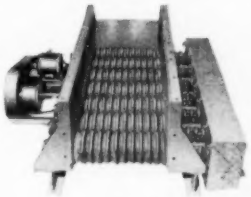
JAW CRUSHERS

Rogers Iron Works builds 12 secondary and 6 primary sizes up to 32 x 40 in. Their long crusher jaw gives superior crushing action, less slippage of material, less wear and less replacements.



APRON FEEDERS

Rogers cast steel apron design gives dependable performance with little maintenance. Write today for information about the Rogers Crusher-Apron Feeder Combination . . . a perfect operating team for low cost production.



LIVE ROLL GRIZZLY

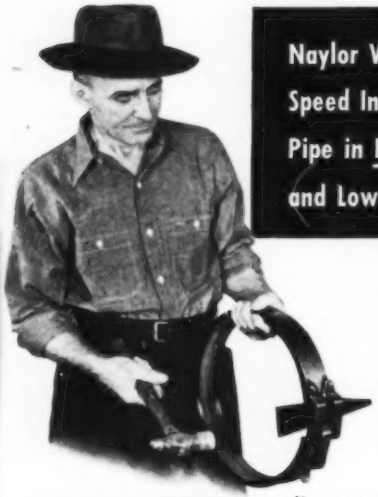
Non-clogging, low-angle grizzly smooths flow of all types of material. Far more economical to operate than a scalping screen. Drives are sealed in oil bath.

For detailed information on Rogers Equipment, write:

ROGERS IRON WORKS CO.

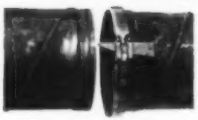
JOPLIN, MISSOURI

Short Cut to Pipe Connections



Naylor Wedge-Lock Couplings Speed Installation of Naylor Pipe in Both Heavy-Duty and Low Pressure Service

Whether it's a permanent, heavy-duty installation, or a temporary, low-pressure line, there's a Naylor Wedge-Lock Coupling that's ideal for connecting Naylor pipe.



These positive type couplings are available in two types—for heavy duty and for low pressure. They provide the quickest, easiest and most economical method of pipe assembly, and a hammer is the only tool required.

The Naylor Wedge-Lock one-piece construction offers definite advantages. Joints can be made up with only one side of the line in the open. The coupling also provides for expansion and contraction. It assures tight, leakfree joints, less power loss, long service life, high salvage and re-use value. Available in sizes for light-weight pipe from 8" to 30" in diameter.

Write for Bulletin No. 513 on Heavy-Duty type; or Bulletin No. 514 for Low-Pressure Coupling.

NAYLOR PIPE

Naylor Pipe Company, 1257 E. 92nd St., Chicago 19, Ill.
New York Office, 350 Madison Avenue, New York 17, N.Y.

Herman H. Miller, manager of the Compressor Division of Worthington Pump and Machinery Corporation in Buffalo, N. Y., has relinquished the managership of his division to act as consultant to his successor, Mr. E. A. Murray.

H. H. Miller

E. A. Murray

Mr. Miller, a 50-year Worthington veteran, plans to retire at the end of this year. He has volunteered to assist his successor, Mr. Murray, for his remaining six months with the corporation.

Mr. Murray, named manager of the compressor division, a graduate of Yale, joined Worthington's compressor division in 1935. In 1940 he was made an electrical consulting engineer or the division, and in 1948 assistant manager.

J. E. Renner

The Lincoln Engineering Company, St. Louis manufacturers of lubrication equipment, announces the appointment of John E. Renner to the position of general sales manager.

Mr. Renner, associated with the firm for fifteen years, has held positions of sales representative, automotive merchandise manager, and sales manager of the automotive division. He will direct sales of the company's automotive, agricultural and industrial divisions, serving all major markets.

The Hammond Bag and Paper Co., of Wellsburg, W. Va. has started construction of a new multiwall paper bag plant at Pine Bluff, Ark. Expected to be in operation by September 1, this new $300,000 fireproof plant will replace the company's present Pine Bluff facilities which are being taken over by the Chemical Corps of the Army on that date.

The one story, reinforced concrete factory, which will provide 60,000 square feet of floor space, is being built on 7 acres of ground located on the Cotton Belt and Missouri Pacific Railroads.

In order to minimize the loss of production time the company has developed a plan to move and place the machinery in operation a piece at a time as the building goes up. This will allow most of the production equipment to remain in operation either in the new plant or

the old as individual machines are being moved.

Allen E. Weaver is local manager of the Pine Bluff plant and J. E. McDonald is superintendent. At present there are about 130 people employed there.

Chester H. Lang, of Schenectady, N. Y., vice-president of the General Electric Co., for the past 10 years, has been appointed to a new post in charge of public relations.

Mr. Lang has directed industrial marketing in the G-E apparatus organization, which is responsible for the company's business in equipment for power generation, distribution, and utilization, for utilities, transportation, industry in general, and Government agencies.

Announcement has been made of the election of John P. Courtright to executive vice-president of The Marion Power Shovel Company, Marion, Ohio.

For several years Mr. Courtright served as vice-president in charge of sales and service and continues in this capacity in addition to his new position.

Robert M. Reindollar, Jr., has been appointed district engineer of the Philadelphia, Pa., office of the Portland Cement Association according to an announcement by Frank T. Sheets, association president. Mr. Reindollar succeeds George C. Britton, who has retired from active service under the association's retirement plan but will continue to serve on a part-time consulting basis.

The appointment of John P. Kadlic as Philadelphia district sales manager for the wire rope division of John A. Roebling's Sons Company has been announced by E. C. Low, vice-president sales. Mr. Kadlic replaced Vincent L. Daulton, who lost his life in a recent train wreck.

J. P. Kadlic

John M. Martin has been named assistant general manager of the Explosives Department of Hercules Powder Company. For the past four years, he has served as assistant general manager of the company's cellulose products department.

Promotions for two officials of Hyster Company's Peoria plant have just been announced.

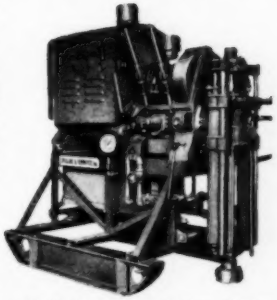
Paul M. Fischer, Peoria factory manager for the past 11 years, has been advanced to the position of chief methods engineer with headquarters in Portland, Oregon. W. H. (Bert) Neptun, assistant factory manager, succeeds Fischer as Peoria factory manager.

Mr. Fischer is one of the original Hyster employees, having worked his way up through the ranks.

MODEL 40-C

The Best Machine for Most Core Drilling Jobs

This is our latest model—designed for highest possible percentage of good core recovery on jobs up to 1000 ft. in depth (⅞" core) no matter how severe the operating conditions. Rugged construction, liberal use of alloy-steel parts and anti-friction bearings throughout, permit long periods of high-speed drilling at minimum expense. Other modern machines and a complete line of improved accessory equipment provide for every drilling and sampling requirement. Write for catalog.



Model 40-C Diamond Core Drilling Machine, with Gasoline Engine Power Unit and Oil-Operated Hydraulic Swivelhead.

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Besides being manufacturers we are one of the oldest and largest contractors for any type of Core Drilling, including Grout Holes and Grouting. Sixty years of successful experience, superior equipment and ample financial resources, assure satisfactory results. Estimates submitted promptly on request.

"TRUCAST" BORTZ DIAMOND BITS

have proved their superiority for years in all types of rock formation. Available in a wide variety of standard and special types ranging from 1½" to 7¾" in diameter. All bits set with first-grade African bortz unless otherwise specified. Bulletin 44-A gives complete information.

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See our four-page insert in the Mining Catalogs

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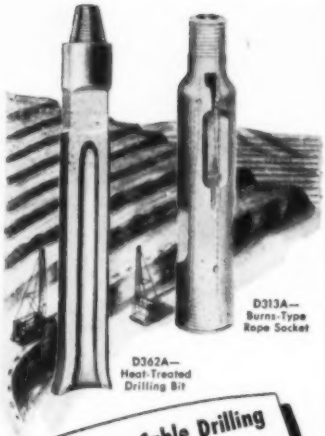

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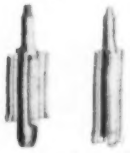
SAFE • EFFICIENT • ECONOMICAL

Spang Churn or Cable Tools are top performers in their fields for drilling test holes when prospecting or sampling . . . drilling blast holes for fragmentation of minerals or overburden . . . drilling and reaming escape, dewatering and ventilating holes . . . and drilling wells for other purposes. Fifty years' experience serving oil, water-well, mining and quarrying operations assures their value.

D606—Reamer-Type
Pilot Bit



LARGE BITS
for pilot hole drilling and stage enlargement reaming of dewatering, ventilation and escape holes.

D370F—Prefabricated
Star Bit

SPANG **CABLE TOOLS**

made by
SPANG & CO., BUTLER, PA.
for
• SHOT BLAST HOLES • WELL DRILLING
• PROSPECT DRILLING • SAMPLING

L. A. Green

L. A. Green, president and general manager of The Industrial Equipment Corporation, is celebrating his fiftieth year in the equipment business.

Originally, the company which was founded in 1902 was known as the L. A. Green Railway Equipment Company. In 1927, the company changed its name to The Industrial Equipment Corporation.

Graydon Broms

Appointment of Graydon Broms as district representative for Hyster Company, is announced by Ray Ronald, sales manager of the western division of the company. Mr. Broms' territory includes most of Oregon, Washington, Idaho, western Montana, Yukon Territory, British Columbia and Alaska.

The A. B. Farquhar Company, York, Pa., has announced the appointments of R. F. Tomlinson, former sales manager of the Conveyor Division, to general sales

R. F. Tomlinson

W. D. Goad

manager, and of W. D. Goad, assistant sales manager, to sales manager, Conveyor Division. C. W. King, sales correspondent, was promoted to assistant sales manager of the division.

Plans for the immediate construction of a large plant addition have been announced by Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio.

E. M. Ikirt, Republic's general manager, stated that the new 80,000 sq. ft. addition and its equipment will be used for the production of wires and textile-braided, mandrel-built, lead-press cured hose.

Edgar T. Gregory has been named manager of flat belting sales, succeeding A. Clarke Mack, resigned, and has been succeeded as operating manager of the Industrial Products Sales department of The B. F. Goodrich Company by Donald E. Schlemmer.

"Tops em all"

for

Rough — and — Tough

SERVICE

"Cape Ann"

FORGED

STEEL DROP BALL

- **RUGGED DESIGN**
- **GREATER IMPACT**
- **ECONOMICAL**

You can't beat the "Cape Ann" Drop Ball for overall performance in "making little ones out of big ones."

Furnished with forged connecting link, protected by deep recess, adaptable for swivel or shackle. Strong alloy steel pin. Cable replacements minimized. Supplied complete as shown.

2000 to 8000 lbs.

Write for Details

CAPE ANN ANCHOR & FORGE CO.

Gloucester • Massachusetts

Lionel E. Booth has been appointed to direct the activities of the re-established Salt Lake City office of the Hardinge Co., York, Pa. The address of the new office is 146 south West Temple Street, Salt Lake City 1, Utah.

Lionel Booth

Mr. Booth is head of Booth Engineers which makes a flotation machine.

The B. F. Goodrich Co., has started construction of a new office and warehouse building at 2940 East 44th St., Los Angeles, Cal. Five sales divisions will occupy the office when completed about November. Tilt-up concrete walls will form the exterior surface, and the interior will have tile flooring, accoustical ceilings and slimline lighting.

The J. B. Ehrsam and Sons Manufacturing Company has opened its own Chicago, Ill., and Fort Worth, Tex., sales offices, according to D. M. Ehrsam, president. Ehrsam manufactures complete machinery for gypsum plaster and wallboard plants, materials-handling and processing equipment, special machinery for the grain and nonmetallic minerals industries, and grain elevator equipment.

Territory served by the Chicago office will be all of northern Illinois, northern Indiana, and southern Wisconsin. The Chicago office at 79 West Monroe Street will be in charge of J. R. Rosenleaf, formerly chief engineer for the company, who has been with the firm since 1929. The Ehrsam line was formerly handled in the Chicago area by the Faleide Engineering Co., which will continue to do so on a non-exclusive basis.

The Texas territory will include all of Texas except the Panhandle, and the Texas office will be in the Dan Waggoner Building, Forth Worth. R. K. Yancey, who has been an Ehrsam employee since 1945, will be the Texas District sales representative. The Wendler Company at Houston, former headquarters for Ehrsam in this area, will continue to handle Ehrsam products on a non-exclusive basis.

Promotion of W. H. Neptun from assistant factory manager to factory manager has been announced by Theron Howard, manager of Hyster Company's Peoria, Ill., manufacturing plant.

W. H. Neptun

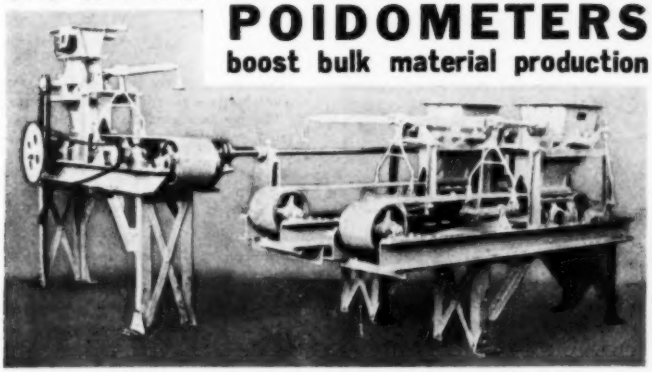
Mr. Neptun came to Hyster four years ago from the Caterpillar Tractor Company.

★★★★★ The High Ranking *Scales*

Five-Star Quality

SCHAFFER POIDOMETERS

boost bulk material production



Battery of SCHAFFER Poidometers in Process Industry.

SCHAFFER Poidometers are unsurpassed for efficiently performing every scaling function, including weighing, feeding, mixing, blending, recording, and proportioning.

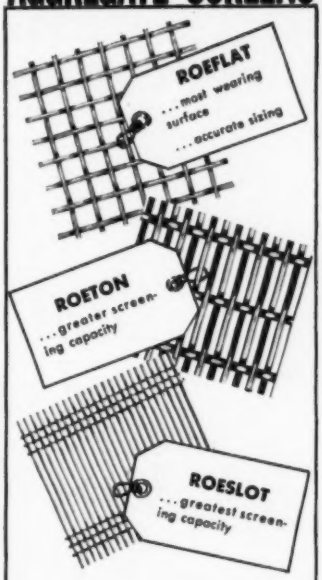
These speedy, automatic, accurate units check material weights at any specified processing stage, and insure a steady flow of uniform products.

Long-service, high-economy Poidometers are available with remote controls for showing and changing feed rate, and with total weight recorders.

Write for Catalog No. 5

SCHAFFER POIDOMETER CO., 2828 Smallman St., Pittsburgh 22, Pa.

AGGREGATE SCREENS



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YOU'LL GET top efficiency and save money with the *right* Roebling Wire Screens. In the first place, one of the screen constructions shown above will give the sort of superior screening that really pays off. And on top of that, each of these constructions is available in Abraso (high carbon steel), Roetemp (oil tempered steel) and in Stainless Steel to meet and beat specific conditions that ordinarily shorten screen life.

Mail coupon today for information about Roebling Aggregate Screens.

WOVEN WIRE FABRICS DIVISION

JOHN A. ROEBLING'S SONS COMPANY

ROEBLING, NEW JERSEY

Woven Wire Fabrics Division
John A. Roebling's Sons Co., Roebling, N. J.

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ROEBLING

BREAKER PLATE LIFE more than 20 times over that of standard type Hammer Mills

A Heavy Duty Gruendler Unit — 250 connected H.P. operating in T.V.A. Phosphate Plant, Godwin, Tenn.

FOR reducing wet stickey materials such as clay, shale, ores, cement, rock, limestone and many chemicals including phosphate rock, bauxite, hydroscopic materials.

"Since 1885" Write for Bulletins on Heavy-Duty CRUSHERS.

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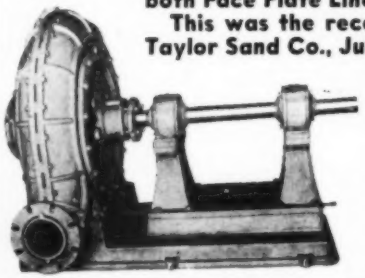
5,000 CARS OF SILICA SAND

Produced in 11 Months on one set of NI-HARD, (Nickel Alloy) WEARING PARTS, (Shell Liner, Impeller and both Face Plate Liners).

This was the recent experience of The Taylor Sand Co., Junction City, Ga., using one of our 6" Centrifugal Sand and Gravel Pumps.



6" heavy duty, bottom discharge, "Tell-Tale" Centrifugal Sand and Gravel Pump, equipped with Ball Bearings and Patented Split Shell.

The "Tell-Tale" Centrifugal Sand and Gravel Pump has a split Shell with equally-spaced Port Holes. Whenever the tough Shell Liner eventually wears thru, there is a tell-tale hiss as air is sucked into the Shell Liner. The Pump immediately loses its prime and stops pumping, thus preventing any wear on the shell.

The Wearing Parts of "Tell-Tale" Pumps are made of an alloy of semi-steel and nickel for toughness. Also available optionally in Ni-Hard for extra long wear.

Hundreds of satisfied users in 22 states and Canada. See your dealer, or write direct for Bulletin P, stating size Pump in which you are interested.

PEKOR IRON WORKS, INC.

Lock Drawer 909 Est. 1892 Columbus, Georgia

According to word from the Fuller Company, the following staff changes recently went into effect:

P. M. Klein, who for several years has worked out of the Chicago district office as a sales engineer, has been appointed district manager of that office.

C. C. Kaesemeyer, formerly district manager of the Chicago office, has been recalled to the main office in Catasauqua, Pa., as sales manager.

H. R. Buckner

The appointmentment of H. R. Buckner as plant manager has been announced by Marc. B. Rojtman, president of American Tractor Corporation, Churubusco, Ind.

Mr. Buckner was plant manager of the Cleveland plants of the Oliver Corporation for 11 years. Prior to that time he was general superintendent of all electric welded tubing plants of Republic Steel.

In addition to supervising the installation of ATC's new assembly plant, Mr. Buckner will direct an extensive expansion program for the company.

A. H. Borchardt

A. H. Borchardt has been elected a vice-president of Worthington Pump and Machinery Corporation, according to a recent announcement.

Mr. Borchardt will have the overall responsibility for the sale of the corporation's entire line of pumping equipment, including centrifugal, reciprocating, and vertical turbine pumps. He has been successively sales manager of the Harrison plant, manager of the Commercial Engineering Department, and assistant vice-president and manager of the Centrifugal Pump Application and Sales Division.

Bob Wagner, who has been narrating and writing The Timken Roller Bearing Company's "Message To Americans" radio program, has joined the advertising department at the Timken plant in Canton, Ohio. He assumed his duties as manager of the news bureau and related public relations work recently.

Quaker Rubber Corporation, Division of H. K. Porter Company, Inc., Philadelphia, Pa., has opened a stock-carrying branch warehouse and sales office at 872 W. Milwaukee Avenue, Detroit, Mich. The establishment of this warehouse is the latest step in Quaker's expansion of distribution facilities to all important industrial areas.

The appointment of Rene D. Wasserman, director of research and president of Eutectic Welding Alloys Corporation, of Flushing, N. Y., to the Research Committee of the National Association of Manufacturers has been announced by Earl Bunting, director of N. A. M.

Westinghouse Electric Corp., Pittsburgh, Pa., has announced the formation of a department of information services to consolidate all informational activities of the company. Dale McFeaters has been named director of the new department. Charles N. Fry is manager of public relations. Charles Ruch has been appointed manager of employe information. John B. Campbell becomes editor of Westinghouse News, the weekly paper for employes. Charles A. Scarlott is manager of technical information and editor of the Westinghouse Engineer, the company's engineering journal. Harry W. Smith becomes manager of community services.

L. J. Fletcher

Leonard J. Fletcher has been elected a vice-president of Caterpillar Tractor Co., Peoria, Ill.

Formerly director of training and community relations, Mr. Fletcher will now assist L. B. Neumiller, president.

Mr. Fletcher joined Caterpillar in 1927 as director of agricultural sales. He was named assistant general sales manager in 1937 and has been director of training since 1941. Seven years ago his duties were increased to include direction of the company's community relations division.

The following three promotions were also announced: Ralph J. Morgan from assistant to the president to executive assistant; Clyde L. Schwyhart from assistant director of training to manager of the newly named education and training department; and Fred R. Jolly from assistant director of community relations to manager of the community relations department.

George R. Brockway has been appointed vice-president in charge of sales and advertising and Harvey M. Rasmussen sales manager of The Rapids-Standard Company, Inc., Grand Rapids, Mich. Mr. Brockway formerly held the post of vice-president and sales manager, while Mr. Rasmussen was assistant sales manager of the materials-handling equipment firm.

Ira G. Needles, vice-president of The B. F. Goodrich Rubber Company Canada Ltd., Kitchener, Ont., since 1945, has been elected president. Mr. Needles succeeds George W. Sawin, president since 1941, who resigned on June 30 for reasons of health.

IT'S DOLLARS and SENSE
TO SALVAGE YOUR
WORN EQUIPMENT...

Rebuild
GYRATORY CRUSHERS
with MANGANAL

U. S. Patents 1,876,738 - 1,947,167 - 2,021,945

11% to 13% Manganese-Nickel Steel
ROUND APPLICATOR BARS

- YOU SAVE DOLLARS by replacing worn metal with MANGANAL. It's faster and more economical.
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- MANGANAL workhardens under impact and abrasion to 550 Brinell . . . tensile strength up to 150,000 P.S.I.
- MANGANAL Round Applicator Bars are available in 11 sizes for all degrees of wear.
- For greater strength and longer wear attach with MANGANAL Bare or Special TITE-KOTE Electrodes.

FREE
Literature on the latest methods for Speedy and Economical Repair of Worn Equipment.
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Unit Type CLINKER COOLER GRATE
Saves Assembly Cost

A NEW IDEA IS BORN . . . fathered by a quarter-century of experience in the manufacture of alloy steel castings for cooling equipment.

This improved type of Clinker Cooler Grate is *different* . . . and definitely better . . . because it comes as a completely assembled unit, ready to drop in place without any expense for assembly work on the job. Its unique design permits a saving in weight, insures increased service life and reduced maintenance. Space for air inlets between bars is controlled by the size of small bosses on back of each bar. Bars are screwed up tight in close contact, and kept in place by two Pyrasteel rods, welded at the ends.

Our customers, including nationally known cement companies, have been using these Clinker Cooler Unit Grates with satisfaction and economy.

Write for details, on special types of Alloy Steel Castings.

CHICAGO STEEL FOUNDRY COMPANY
Kedzie Avenue at 37th Street
Chicago 32, Illinois
Makers of Alloy Steel for Over 40 Years

legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Recently a reader asked this question: "As operator of a quarry, wherein blasting is done, am I liable for damages to nearby private homes?"

The answer is: Only if a jury decides that the damage to the homes resulted from your negligence. In other words, if you prove that you used standard charges, you can avoid liability. Otherwise you are liable.

For example, in *Kelly v. McKay*, 233 S. W. (2d) 121, one McKay sought to recover judgment for damages to improvements on his real property alleged to have been caused by explosions in the caliche pit of one Kelly. McKay alleged generally that Kelly was negligent in causing explosions and blasts of such power and intensity as to produce violent shocks and tremors to the earth underlying McKay's premises, and damage to the buildings thereon. Further testimony showed that simultaneously with explosions in the caliche pit, McKay's home, between 700 and 1,200 feet away, was shaken and that use of explosives *reasonably necessary* in operation of the pit *would not* cause earth tremors at such distance.

In view of this testimony the higher court held Kelly liable to McKay, and said:

"One test of negligence, in a case like this involving explosives, is whether an excessive amount of explosives is used. Applying this test to the evidence in this case, we think there was some evidence which would have sustained a finding of negligence on the defendant's (Kelly's) part."

Arbitrary Zoning

Modern higher courts consistently hold that arbitrary and unreasonable restrictions upon the use and enjoyment of property, or deprivation of property, may not be made under the guise of zoning.

For illustration, in *Granger v. Board of Adjustment*, 44 N. W. (2d) 399, the testimony showed facts as follows: The Williams-Wilbert Vault Works applied for a permit to repair a building used since 1937 for the manufacture of concrete burial vaults.

The higher court held that since the building was being used for this purpose when the new zoning ordinance was passed, the city must issue a permit for repairs to the building. This was so although the new zoning ordinance prohibited construction or use of buildings in this area for any purpose except residences. The court said:

"Under the guise of zoning, arbitrary and unreasonable restrictions upon the use and enjoyment of property, prohibition of use which does not interfere with the equally rightful use and enjoyment by others of their property, or deprivation of property without due process of law may not be made. Zoning being an exercise of police power by the municipality, which is a power delegated from the State, such delegated power must be strictly construed."

This court explained that the building could *not* be enlarged or otherwise remodeled to *increase* the extent of the present business, but that *no* zoning ordinance is valid which restricts or otherwise prevents or interferes with present use of the property.

Plant Burns

As above explained, a new zoning ordinance will not prevent a company from continuing the same business operations. According to a late higher court decision, if the buildings burn, the company may reconstruct the same size and

It's faster, low cost drilling here . . .

Tungsten carbide Rok-Bits: 4-Point, Cross Bit or 2-Point Chisel Bit—gauge sizes, 1⅜" to 4".

but this makes the difference

It's Rok-Bit's square threads that assure a tight, trouble-free connection for the bit's long life. They cushion and absorb the destructive forces which frequently cause premature failure in conventional bits. New, free 16-page booklet on use and care of carbide bits available—WRITE! Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Penna. *Branch:* 350 Depot St., Asheville, N. C.

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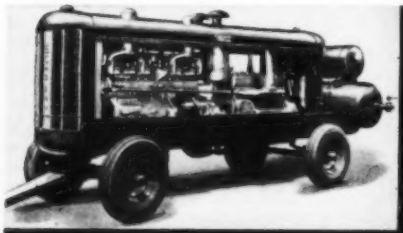
CARBIDE ROK-BITS • INTRA-SET DRILL STEEL • ALL TYPES OF HOLLOW DRILL STEEL • MOIL POINTS • ASPHALT CUTTERS • SABUR POINTS, etc.



600 CU. FT.
DIESEL
ENGINE DRIVEN
COMPRESSOR

WRITE FOR BULLETIN 5025

SCHRAMM INC.
The Compressor People
WEST CHESTER, PA.

kind of buildings, but not a larger structure or one with greater area.

For example, in *Humphreys v. Stuart Realty Corporation*, 73 Atl. (2d) 407, it was shown that a new city ordinance was passed which zoned a business district into a residential area. A company then was doing business in this area. Soon after the new ordinance was passed, the company's plant burned to the ground.

In subsequent litigation the higher court held that the company could reconstruct its plant, provided that the buildings would not exceed in height and area the buildings destroyed. The court held that while the company would not be permitted to extend its past operations, or enlarge its plant, yet it could not be prevented from continuing the same business with the same size and kind of buildings.

Compensation Refused

All higher courts agree that it is the duty of a disabled employee to accept tendered favored employment, which he is physically able to perform, and also he must refrain from criminal conduct, or the employee cannot receive compensation for an injury.

For example, in *Todd v. Hudson Company*, 43 N. W. (2d) 854, it was shown one Todd was hired as a common laborer and remained such during the entire period of his employment. He was injured while working as a sandblaster. Later he sustained another injury and finally was given light work. Soon afterward he was given favored employment as a watchman and subsequently he was discharged for gambling on the premises.

The higher court held that Todd was not entitled to compensation under the State Workmen's Compensation Act, and said:

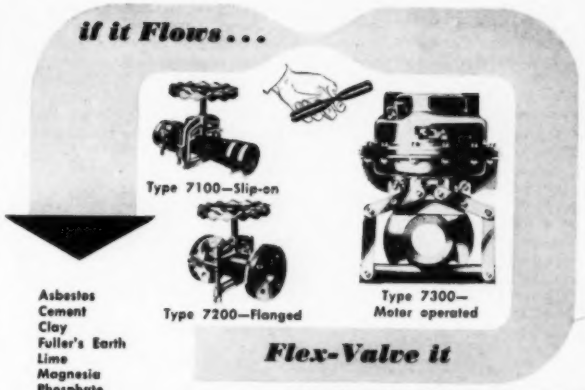
"Where he (Todd) engages in criminal gambling activities while at work and is discharged for that cause, he cannot be entitled to compensation for the resultant loss of earnings. His favored employment has ceased through his own violation and turpitude and not by reason of his accidental injury."

For comparison see *Pigue v. General Corporation*, 317 Mich. 311. Here an employee was disabled while performing his regular work, and was given favored clerical employment. The union to which he belonged went on a prolonged strike, and the employee applied for workmen's compensation.

The lower court held that he was not entitled to compensation as his employment ceased solely through his voluntary refusal, in concert with the other union members, to perform work.

New Injury Law

The higher courts hold that an injury or death is compensable under the State Workmen's Compensation Act, *if* its occurrence resulted from the employment. On the other hand, if the employee is not protected by the State Workmen's Compensation Act, his sole recourse is a suit against the employer for damages. Another important point is that under no circumstances is an employer liable in *damages* for injury or death of an employee, unless the testimony proves



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conclusively that such injury or death was caused by *negligence* of the employer. However, under the State Workmen's Compensation Act an employee can receive compensation whether or not the injury or death resulted from negligence of the employer.

Recently a higher court rendered an unusual decision to the effect that if an employee's present disability is activated by his employment, he is entitled to recover adequate compensation under the State Workmen's Compensation Act.

For illustration, in *Bell v. Batesville White Lime Company*, 230 S. W. (2d) 643, the testimony showed facts as follows: When one Bell was 14 years old he had rheumatic fever. This disease usually creates a weakened heart condition. A person having a rheumatic heart may have normal existence for years, but in most cases the heart condition eventually flares up and ultimately proves to be fatal. Further testimony showed that Bell had worked for the Batesville White Lime Company for many years prior to 1945, when he became totally disabled as a result of heart trouble. Three years later Bell's death resulted from this heart disease. His dependents sued the Batesville White Lime Company to recover compensation, under the State Workmen's Compensation Act.

During the trial testimony was given that Bell could have lived longer had he not suffered an accident while working for the Batesville White Lime Company. In view of this testimony the higher court awarded Bell's dependents compensation.

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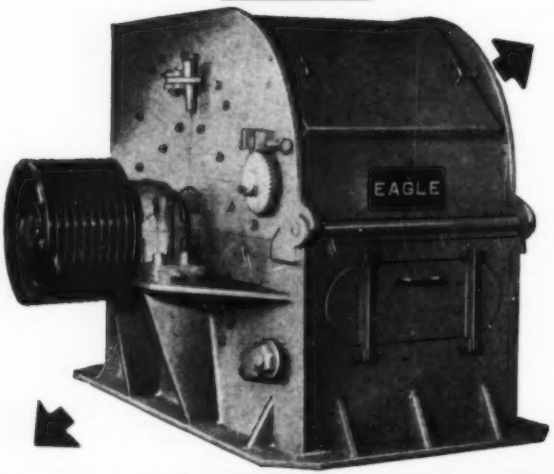

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Corporation Is Liable

Question: "Is a property owner liable for contracts made by his employe? Is the same law applicable to corporations?"

Answer: It is well settled law that both a property owner and a corporation are bound by contracts made by employes who act "within the scope of the employment." An ordinary employe of a corporation must have proper authority from the directors of the corporation to make valid contracts. However, the president is conceded by the courts to possess natural power to bind the corporation in all business transactions pertaining to the corporation's business.

For illustration, in the leading case of *Grummet v. Fresno Glazed Cement Pipe Co.*, 181 Cal. 509, the court said that a corporation can act only through its agents, and that the president of a corporation has the power in the ordinary course of business, and in furtherance of the corporate interests, to execute contracts and to bind the company. The court said:

"The president is, by virtue of his office, recognized as the business head of the company, and any contract *pertaining to the corporate affairs*, within the general powers of such officer, executed by the president on behalf of his corporation will in the absence of proof to the contrary be presumed to have been done by authority of the corporation."

On the other hand, under no circumstances will either an ordinary property owner or a corporation be held liable on contracts made by an ordinary employe, unless definite proof is given that such employe had proper authority to make the contract.

Similar Trade-Marks

All higher courts hold that two similar trade-marks, used on the same classification of merchandise, cannot be registered.

For example, in *G. H. Packwood Mfg. Company v. Cofax Corporation*, 183 Fed. (2d) 196, it was shown that a company registered a trade-mark "Pax" which had been used for many years on cement. Another company applied for registration of the trade-marks, "Pax", "Paxite" and "Paxomat" to be used on similar products sold to the same class of purchasers.

The United States Court of Customs and Patent Appeals refused to register the new trade-marks, saying:

"Where the marks are identical, such as those now before this court, the use of the mark by the newcomer is unlawful, unless the newcomer's use is so foreign to that of the prior owner as to insure him not only against confusion in trade but also against injury to his reputation."

Holds Contractor's Supplies

Recent a higher court held that although a contractor breaches his contract, the property owner cannot refuse to give the contractor possession of the installed materials and equipment which are movable.

For illustration, in *F. M. Cooley Company v. Stoeffler*, 92 N. E. (2d) 926, the testimony showed facts as follows: A contractor made a contract with a

More Information, Please

CHECK AND MAIL THE CARD BELOW FOR ADDITIONAL INFORMATION ON NEW MACHINERY AND SUPPLIES

1. **Barber-Greene Conveyors for Mines.** Bulletin 676-MC. This eight-page bulletin deals primarily with the application of conveyors to mining operations but the information is equally applicable to all conveying problems. Portable types for low headroom, slope types for general use, panel types for ready portability, and the auxiliary equipment are well illustrated and described. Barber-Greene Company.

2. **Marion All-Purpose Excavators.** Bulletin No. 403. Thirty-two pages covers the line of machines made by the company. Specifications and types of service that can be obtained with each machine are given. Hoisting capacities for all models are listed. Marion Power Shovel Company.

3. **Supreme "Speed-Kut" Masonry Saw.** Details of the construction of the masonry saw and illustrations of it occupy the major part of this folder. Some space is used to describe the line of abrasive blades used with the saw. Supreme Equipment Corporation.

4. **JSCO Vibro Screen, Feeder, Conveyor.** Bulletin K.J. 101. Vibrating equipment for handling bulk materials such as screens from 1 to 10 decks, conveyors and feeders are described in this folder. Johnstone Division of Kaysing Iron Works.

5. **The Philadelphia Story.** The history in the twenty-eight two-color pages of this booklet is not that of old Philadelphia but that of the modern plant of the Philadelphia Division of Yale and Towne Manufacturing Company. The illustrations and text show how the materials handling machines—hoists, hand trucks, lift trucks are made and how they are applied in the plant itself. Modern manufacturing methods and modern materials handling are brought out. Philadelphia Div., Yale & Towne Mfg. Co.

6. **Aeroquip Flexible Hose Lines.** Bulletin 113. Detachable, reusable hydraulic fittings, self-sealing couplings, and breakaway couplings are pictured in this double folder. Users of hydraulic equipment will be interested in these accessories. Aeroquip Corporation.

7. **The S-A Conveyor.** Volume 196. A twenty page magazine type catalog that shows application of the various types of conveyors made by the company. The text is descriptive and serves to point out the problems involved in the applications shown. Three pages are used to portray the Knittel Crusher, ball bearing units and conveyor carriers. Stephens-Adamson Manufacturing Company.

8. **Stock Roller Chains and Sprockets.** No. C.55-50. This catalog gives details on prices, available sizes of sprockets and information on stock roller chain up to 2-inch pitch. Data on drive selection, service factors, installation, and service are included. Morse Chain Company.

9. **Kakest Mortar Plane.** A device for applying a uniform strip of mortar to masonry units is described in this folder. Advantages cited are uniformity of mortar, no spillage, faster application and less work in handling mortar. Kakest Company.

10. **Dewatering Machinery.** Bulletin No. 551. Continuous thickening screens, screw type machines, and roller type dewatering presses are illustrated and described in the eight pages of this attractive brochure. This gives the major features of each type without a lot of unnecessary detail. It serves to point out the different dewatering processes available and to acquaint the reader with them. General American Transportation Corporation.

11. **Portable Troughed Belt Conveyors.** Form Number A-298 describes the mast hoist type for longer lengths and greater heights. Lengths from 50 to 70 ft. are listed and heights up to 32 ft. for the Model 240. Form number A-296 describes the Model 230 which is a portable conveyor with a standard frame. Baughman Manufacturing Company.

12. **Stop Clutch Trouble with Velvetouch Matched Facing Sets.** Form No. A-4. A six-page folder that brings out the advantages of the all-metal Velvetouch clutch plate and facing combinations for heavy duty use. Installation is described as well as the construction features of the sets. S. K. Wellman Company.

13. **Erickson the Workhorse of Lift Trucks.** Eight pages show the various models and their application to various jobs. Platform models, lift models and other standard models and accessories are shown. Custom built models are shown with some of the special features. Erickson Power Lift Trucks.

14. **Electric Power for Industry's Third and Biggest Expansion.** Bulletin GEA-5600. This bulletin points out ways of obtaining electric power equipment for quick expansion at low cost and with a minimum of critical materials. Stories, diagrams, and photos point out the way that savings in time, material, and money can be saved by utilization of standardized components for power distribution and supply. General Electric Company.

15. **"Badger" Eject-It Box.** A leaflet that illustrates the ejector type of box for trucks. The mechanism of moving the entire box off the bed is described and diagrammed. Wisconsin Foundry and Machine Company.

15A. **American Revolver Cranes.** Catalog No. 400-R-3. A pictorial catalog that shows views of cranes at work on a great many materials handling jobs in all parts of the world. Information is given about each picture that serves to complete the presentation. Load data for the various sizes are given and the pictures show the types of mounting available—bridge, gantry, boat, barge, or stationary. An interesting booklet for all persons handling large quantities of materials. American Hoist and Derrick Company.

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16. Your Fence, How to Choose It. . . . How to Use It. Fencing from small enclosures around electrical substations to large ones around plants and properties are all covered in this thirty-four page booklet. Types of fencing, uses, methods of construction and other basic information is presented for the prospective fence buyer. All points are well illustrated by photos or drawings. The person who has any property or plant protection problem will find a great amount of information in the booklet. Cyclone Fence Division, American Steel and Wire Company.

17. Heavy Duty Federal Trucks Will Do Your Job Better. Form SA-170. A folder that illustrates the many types of heavy-duty vehicles available including six-wheelers. It also has sections covering Federal gasoline and diesel engines, special heavy-duty construction features and specifications on the entire line. Federal Motor Truck Company.

18. Lull Shoveloader. Form AD-32. Six pages packed with information on the shovel loading attachment adaptable to several makes of tractors. Two pages use diagrams and drawings to answer 18 of the commonest questions about loaders. Another page lists 63 features of the line while general illustrations and specifications fill the balance of the folder. Lull Manufacturing Company.

19. Quinn Pipe Forms in Varied Shapes. A loose-leaf catalog sheet that illustrates some of the various shapes of concrete pipe forms for special applications. Arch culverts, tees, elbows, tapered manholes, cattle passes, posts and culvert ends are the shapes illustrated although many others are mentioned. This page is designed to be inserted in the Quinn Loose Leaf Pipe Forms Catalog which illustrates the complete line. Quinn Wire and Iron Works.

20. The Little Giant Crane. Half of this six-page folder illustrates construction features of the Little Giant Cranes. Clutches, crawlers, drum assemblies, turntable, hoist assembly, swing assembly and the basic unit are all pictured. Boom attachments for trench hoe, shovel, or crane are illustrated. Specifications are given for the machine either truck mounted or crawler mounted and for the special swamp crawlers. Little Giant Crane and Shovel.

21. Pioneer Steel Storage Bins. Form No. 629. Storage and loading bins are covered in a folder. Size, specifications and applications are included, together with the types of bin gates available for discharging the bins. Single and multiple units up to 45 yds. capacity are covered. Pioneer Engineering Works.

22. Super-Trough Conveyors. Two folders that illustrate and describe the Super Trough line of conveyors. Model ST is a portable machine that is suitable for abrasive substances as well as other materials. Model WC is designed for handling wet concrete and similar wet substances that need conveying from mixers or process machines to storage or loading facilities. Details and specifications for the models are included. Conveyor Engineering and Supplies Corp.

23. AgiTair Industrial Furnaces for Process Drying and Product Heating. Form No. HGF-101-12-46. The dozen pages of this bulletin present the story of the industrial direct-fired furnaces made by the company. These are used for supplying heated air to dryers, pulverizers, and similar devices and to heat asphalt and liquids. The various models are illustrated and complete descriptions of them are included. Two pages list some of the larger users where the furnaces are used for drying slurry, clay, limestone, shale and abrasives. Air Devices, Inc.

24. Link-Belt Vibrating Screens. Book No. 2377. A 20-page illustrated book on Model "UP" vibrating screens for dry-screening of light and fine materials and Model "NRM" for separation of liquids from solids. Both types of screens are available in a wide range of sizes and the dry screens can be furnished in single or multiple deck, open or enclosed styles. Data of value for the engineer and operator include selection of proper screen and cloth, dimensions, weights, horsepower requirements, etc. Photos show use in sizing, scalping, removing foreign material to prevent waste or pollution, and other services. Link-Belt Company.

25. Rubber and Synthetic Rubber Valves for All Fluid Services. Bulletin No. 500. Slurries, cement, sand, abrasives, water and other pipe conducted materials may be controlled by the line of flexible valves of rubber and synthetics. These valves are of the pinch type and available in hand or automatic models. The 16-page bulletin illustrates the models and gives sizes, dimensions, and other data on them. Flexible Valve Corporation.

26. Denver-Dillon Vibrating Screens. Bulletin No. 53-B11. The contents of this 12-page bulletin consist of a listing of the operating features, a description of the floating motion vibration, functional design, and specifications. Data for determining screen requirements are given and the application in specific industries pointed out. The back page lists other products of the company. Denver Equipment Company.

27. Vertical Turbine-Type Pumps. Form 7228. The line of APH semi-open impeller and the APK closed impeller turbines are described. These are available in single or multi-stage units and will handle volumes up to 15,000 g.p.m. and pressures to 250 p.s.i. The vertical arrangement of the pumps requires a minimum of floor space while they will work against high discharge heads. Dewatering mines and pits, water supply service, and general liquid pumping are some of the major applications for these units. Dimensions are included. Ingersoll-Rand Company.

28. Jeffrey-Traylor Electric Vibrating Feeders and Conveyors. Catalog 830. A comprehensive 88-page catalog that explains the vibrating principle and the method of achieving it. Applications to many feeding problems are shown in detail including grizzlies, pan type, water-cooled, tubular, dust tight, spreading type, and sizes from laboratory use to 2,000 t.p.h. Conveyors use 10 pages of the booklet while other vibrating equipment is mentioned such as coolers, screens, and packers. Four pages highlight other products of the company—bucket elevators, conveyors, crushers, pulverizers, and general information. The Jeffrey Manufacturing Company.

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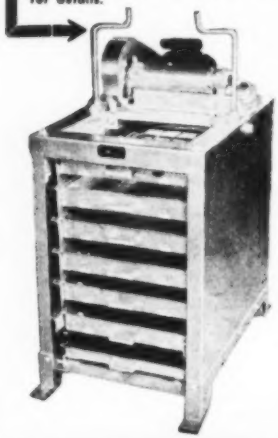

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property owner to furnish labor and material to do a job. When the job was completed, the property owner refused to pay the contract price, claiming that the contractor had substituted certain products that were grossly inadequate and inefficient.

The property owner sued the contractor for damages and recission of the contract. However, he did not offer to permit the contractor to take possession of movable materials and equipment left on the property. Therefore, the higher court held that the property owner could *not* rescind the contract, and was not entitled to damages.

Contract Held Valid

Some time ago a reader wrote, as follows: "How can a contractor determine whether his bid which was accepted by a city is valid? Suppose that a state law limits the amount a city, county, or state can spend for a project. How can a contractor who is awarded the contract know whether he has a good and valid contract, particularly if two or more estimates of the cost of the project are made?"

The writer briefly answered this inquiry at that time, but recently a new and important higher court decision was rendered which I shall review in detail for the benefit of readers.

For example, in *Johnson et al. v. Utah-Idaho Concrete Pipe Company*, 223 Pac. (2d) 418, it was shown that a city advertised for bids on construction after receiving an estimate from the city engineer but before receiving an estimate from the firm of engineers who prepared the plans and specifications. In other words, the higher estimate from such latter firm was received before the city opened or considered any bids.

In subsequent litigation the higher court held that the city was not limited to the estimate of the city engineer and that a state statute requiring rejection of all bids in case bids exceed "estimate of cost" was sufficiently complied with.

In this case a state law provides: "In case bids and the proposals received shall exceed the estimate of the cost of making the improvement, all shall be rejected and the governing body shall advertise anew in the same manner as before."

The details of this case are as follows: A suit was filed by taxpayers of a city to declare null and void an award and contract given to the Utah-Idaho Concrete Pipe Company by the city to replace a culinary water supply pipeline.

The facts are not in dispute. Early in 1949 the city determined that it would be necessary to make improvements in its water supply system. It contemplated a replacement of a section of the culinary water supply pipe line. The commissioners of the city having arrived at the conclusion that the improvements were necessary, and it being apparent that a bond issue would have to be floated to pay for these, requested the city engineer to make an estimate of the costs of such improvements. The city engineer after a hasty survey of the situation estimated the cost would be

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$257,000. The commission then passed an ordinance calling for a special election to submit to the voters the question of incurring a bonded indebtedness to pay for all the proposed improvements. At the special election held in pursuance to this ordinance the vote was favorable for the incurring of such expenditures. The commission then employed a firm of private civil engineers, who furnished the commission with plans and specifications for the proposed improvements, whereupon the city advertised for bids. Five bids for this system were received. The same day on which the bids were opened, the civil engineering firm employed by the city filed its estimate of the cost of construction of the water line with the City Recorder.

The bids were evaluated by computing the annual amount necessary to replace the improvement at the end of its economic life. The life of the various materials recommended to be used in the project were given the following rating for the purpose of determining the length of time such materials would be used before replacement would be necessary: cast iron, 100 years; centrifugal concrete, 100 years; asbestos cement, 100 years; and steel, 50 years.

After the bids submitted had been evaluated on the above formula, the commission had two bids which it had to consider seriously before the awarding of the contract. One was by the Utah-Idaho Concrete Pipe Company in the amount of $266,347.60, proposing to use centrifugal concrete pipe and the other by A. H. Palmer and Sons, in the amount of $233,228.50, using steel and evaluated under this formula as being $266,041. The commission decided that it would be more advantageous to use centrifugal concrete pipe and awarded the contract to the Utah-Idaho Concrete Pipe Company.

Almost immediately upon the awarding of the contract to it, the Utah-Idaho Concrete Pipe Company commenced work on the project and expended considerable sums of money on it before the suit was commenced.

The tax payers alleged that the contract had been awarded fraudulently, arbitrarily, and in bad faith, and that although the city engineer's estimate for the performance of the work was $257,000, and the bid accepted was in excess of this sum, the commission did not reject all bids and advertise anew, as provided by the above mentioned state law.

The higher court held that the city engineer had estimated the cost as $257,000 and that the city had been properly authorized at the special election to create a bonded indebtedness for the improvements; that the city and its officers did not act fraudulently or in bad faith, nor were they guilty of arbitrary or capricious action in awarding the contract to Utah-Idaho Concrete Pipe Company; and that the latter had in good faith already commenced to work on the project and had expended considerable sums on it.

The higher court held the contract which was awarded to Utah-Idaho Concrete Pipe Company valid, saying:

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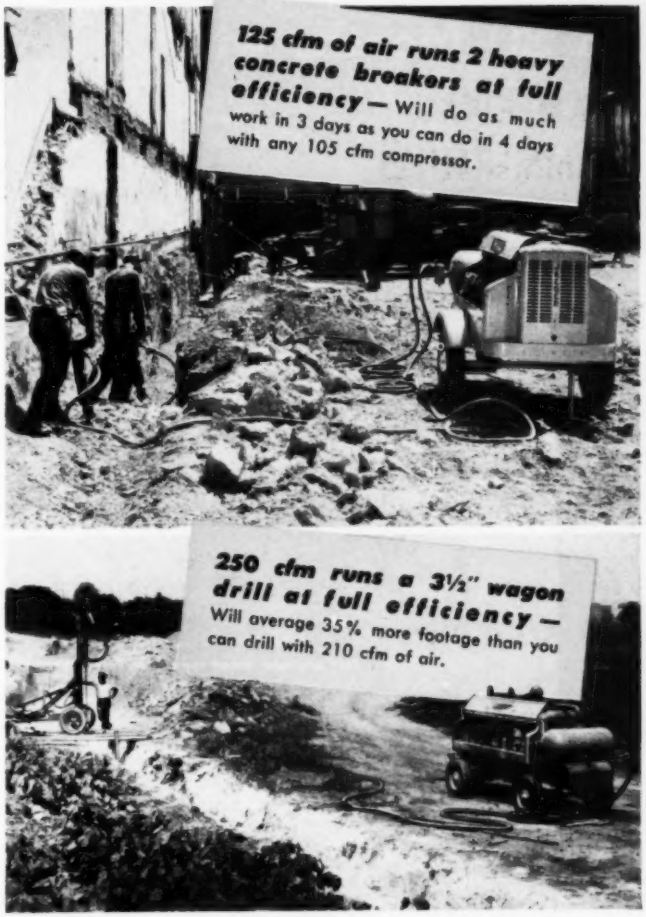
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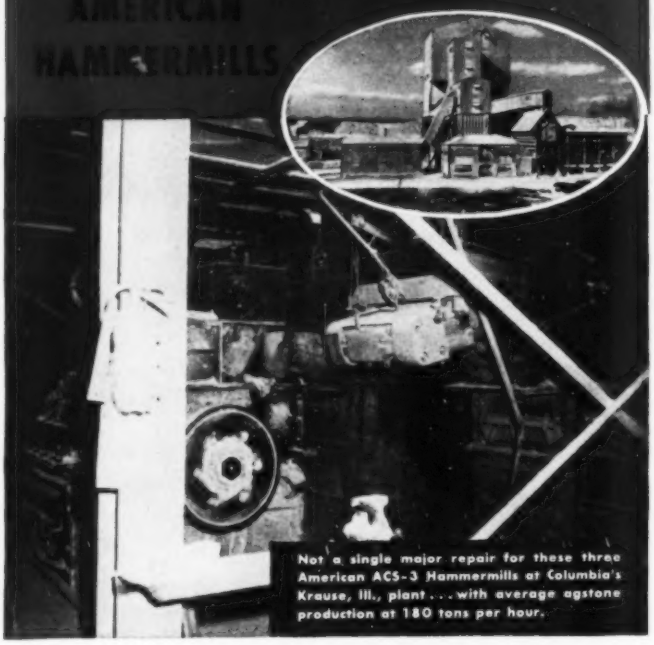

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"It is conceivable that a commission may deliberate anew after advertising for bids and decide not to proceed with whatever improvement they had previously contemplated making. Under such circumstances it could hardly be argued that a bidder would have a right to demand that a contract be awarded. Before an actual award of a contract is made, the commission can continue its contemplating of the desirability of making the improvement. It follows, therefore, that from the wording of the statute itself there is no particular limitation of the time within which an estimate of costs must be submitted to the commission for its consideration, as long as it is submitted before the bids are opened. The statute provides that if all bids exceed the estimate of costs submitted to the commission that it shall reject all bids and re-advertise for further bids. This suggests that the estimate of costs is the basis upon which a contract can be awarded, but it does not suggest the time at which such estimate of costs must be submitted to the commission, other than that it must have such estimate before it for consideration before the bids are opened."

This court also held that under these circumstances, the commission could consider either the estimate made by the city engineer, or the estimate made by the firm of engineers who prepared the plans and specifications.

Not Within Scope

Considerable discussion has arisen from time to time over the legal question: "Does an injury arise out of the employment when it results from a risk *incident* to the employment?" The answer is yes. On the other hand, if the employee has not begun a day's work when an injury is sustained, he can receive *no* compensation.

For example, in *Mansfield v. Industrial Service Company et al.*, 222 Pac. (2d) 373, it was shown an employee kept his employer's sand and gravel truck at his own home during the night. The following morning he drove the truck to a specific place to get a work ticket and signed for work previously done. After leaving he was injured in a collision while enroute to pick up a tire for the truck.

The higher court refused to award the employee compensation under the State Workmen's Compensation Act on the grounds that the injury did not arise out of or in "course of employment." The court said:

"Neither this act nor the driving of the truck to the service station to retrieve a tire for it renewed his employment. An injury arises out of the employment when it results from a risk incident to the employment."

Sun Valley will become the San Fernando Valley headquarters of the Consolidated Rock Company, presently at 6514 Lankershim, North Hollywood, Calif., following the construction of a garage and office building within the next three months, company officials announced.

traffic news

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 88386 (1)—Proposed to establish on crushed stone, in bulk, in open-top cars, carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from North Baltimore, O., to Selfridge Aviation Field Siding, Mich., 201 cents per net ton.

Docket 88390 (1)—Proposed to establish on crushed stone, carloads, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply, from Carey, O., to Wayne, Mich., 189 cents net ton.

ILLINOIS FREIGHT ASSOCIATION HEARING

Docket IRC 511-1066—Proposed to establish on agricultural limestone, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full visible capacity, actual weight will apply, but not less than 60,000 lb. from Lehigh, Ill., to Illinois Central Railroad stations shown below:

	Cents per ton —2000 lb. Present	Proposed
Greenup, Wheeler, Newton, Boss, and Oblong, Ill.	124	114
Dietrerich, Dundas, Robinson, and Palestine, Ill.	138	114

NOTE: Proposed rate will be published as truck competitive rate and will be subject to an expiration date of one year from date of publication. (Including ExParte 162, 166, 168 increases and subject to ExParte 175 increase.)

Docket IRC 511-1072 (E. C. Docket 4283)—Proposed to establish on stone, crushed, in bulk, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Lehigh, Ill., to Moronts, Ill. Present: $1.09 per net ton, including all increases except ExParte 175. Proposed: 89 cents net ton, including all increases except ExParte 175, to which it is subject.

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 88397 (2)—Proposed to establish on stone, fluxing, furnace or foundry, melting or refractory, unburned, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when cars are loaded to full cubical or visible capacity, actual weight will apply from Bloomville, O., to Cleveland, O., 163 cents gross ton.

Docket 88412 (2)—Proposed to establish on crushed stone, in bulk, in open-top cars, carloads, minimum weight 90 percent of marked capacity of car except that when car is loaded to full cubical capacity actual weight will apply from North Baltimore, O., to various destinations in Michigan as shown below:

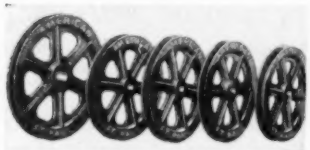
To	Proposed
Dlann	1.61
Adrian, Milan, and Tecumseh	1.72
Ann Arbor	1.77
Hudson, Manchester	1.79
Durand, Owosso, and Rives Jct.	2.01
Hillsdale, Lakeland	1.85
Albion, Charlotte, and Lansing	2.07
Battle Creek	2.13
Annpere, Cement City, Jackson Jonesville, and Ypsilanti	1.89

(Rates include ExParte 162, 166, 168 increases and subject to ExParte 175 increases.)

GENERAL FREIGHT TRAFFIC COMMITTEE—Eastern Railroads

Bulletin G-4377 (Carrier)—Proposed to establish on limestone, ground or pulverized (will not apply when any other material or materials have been added, physically or otherwise, to the natural limestone, nor on pigeon or poultry grit) carload minimum weight 60,000 lb. from Piqua, O., to New York, N. Y., $5.65 per net ton, subject to ExParte 175 increase, in lieu of $6.93.

Bulletin G-4402 (Shipper)—Proposed to establish on screenings, crushed limestone, in open-top cars, carload minimum weight



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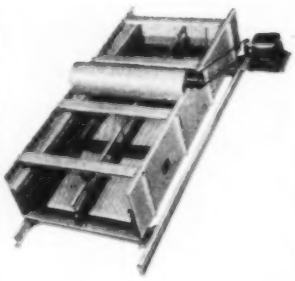

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90 percent of marked capacity of car, from Plum Run, O., to Seaman, Dukes, Reedy, Billings, Barrs, Nancys Run, and Spencer, W. Va., $2.43 per net ton, subject to Ex-Parte 175 increase.

FREIGHT TRAFFIC COMMITTEE TRUNK LINE TERRITORY RAILROADS

Docket TL M-1528 (Shipper)—Proposed to establish on crushed stone, carload minimum weight 90 percent of marked capacity of car from Bowden-Faulkner, W. Va., to Webster Springs, W. Va., $1.44 per net ton, subject to ExParte 175 increase.

Docket TL M-1537 (Carrier)—Stone, natural (other than bituminous asphalt rock) crushed, carload minimum weight, per item 65 of N.Y.C. Tariff ICC No. 342, from Oaks Corner, N. Y., to Cowley and Troy, Pa., $1.60 per net ton, subject to ExParte 175 increase.

WESTERN TRUNK LINE NEW APPLICATIONS

Supplement 2 to E-41-1429—Sand, gravel and crushed stone, carload, amend application E-41-1429, dated June 8, 1951, by the addition of Jasper, Minn., as a point of origin on the same basis as proposed from the involved South Dakota origins.

Supplement 2 to E-41-1430—Crushed stone, carload, from Sioux Falls and Dell Rapids, S. D. Amend application E-41-1430, dated June 11, 1951, to include Sioux Falls, S. D., and Jasper, Minn., as points of origin.

PACIFIC SOUTHCOAST FREIGHT BUREAU PROPOSALS

Docket 2045 (Shipper)—Rock, lime, in open cars, from Bowman, Calif. Request for rates per hundredweight, minimum 50 tons, to California points, that is, Stockton 8½ cents; San Francisco, Oakland, and Willows, 12 cents; Petaluma, 13 cents; Fresno and Santa Rosa, 14 cents.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 57212 (I)—Proposed to establish rates of 458 cents per ton in open cars and 491 cents in closed cars on gypsum, crude or crushed (not ground), Carla and Winnfield, La., to Tarrant, Ala. Not subject to ExParte 162, 166, or 168 increases, same as in effect to Birmingham.

Docket 57370 (I)—Proposed to reduce rates on gypsum, crude or crushed (not ground), Carla and Winnfield, La., to Cape Girardeau, Mo., in relation to the rates from Murfreesboro, Ark., using the Texas mileage scale as a basis, viz.: 18 cents in open-top and 19 cents in closed cars, not subject to ExParte 162, 166 and 168 increases.

WEEKLY DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION SUBMITTALS

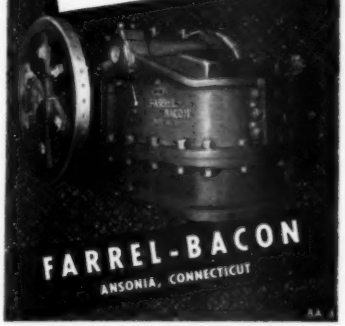
Docket A-7622 (c)—Proposed to establish on crushed stone, in closed cars, carload, Lithonia, Ga., to E. St. Louis, Ill., 456 cents per net ton, not subject to X 162-6-8.

Docket A-5624 (E. R.R. (S) C-Gen. 327)—Proposed to establish on lime and limestone from Mosher-Ste. Genevieve, Mo., to points in official territory. Correct tariff of increased rates charges X-175, Item 150, by eliminating Mosher-Ste. Genevieve, as taking St. Louis basis on lime and limestone.

FARREL-BACON JAW CRUSHERS

SIZES 60"x48" to 10"x7"

Optional design features include: (1) Meehanite frame, sectionalized when necessary; (2) removable water-cooled bearings; (3) improved design of swing-jaw bearing; (4) force-feed oil lubrication, or circulating system if desired; (5) split flywheels; (6) flat or V-belt drive. *Write for further details or engineering assistance.*



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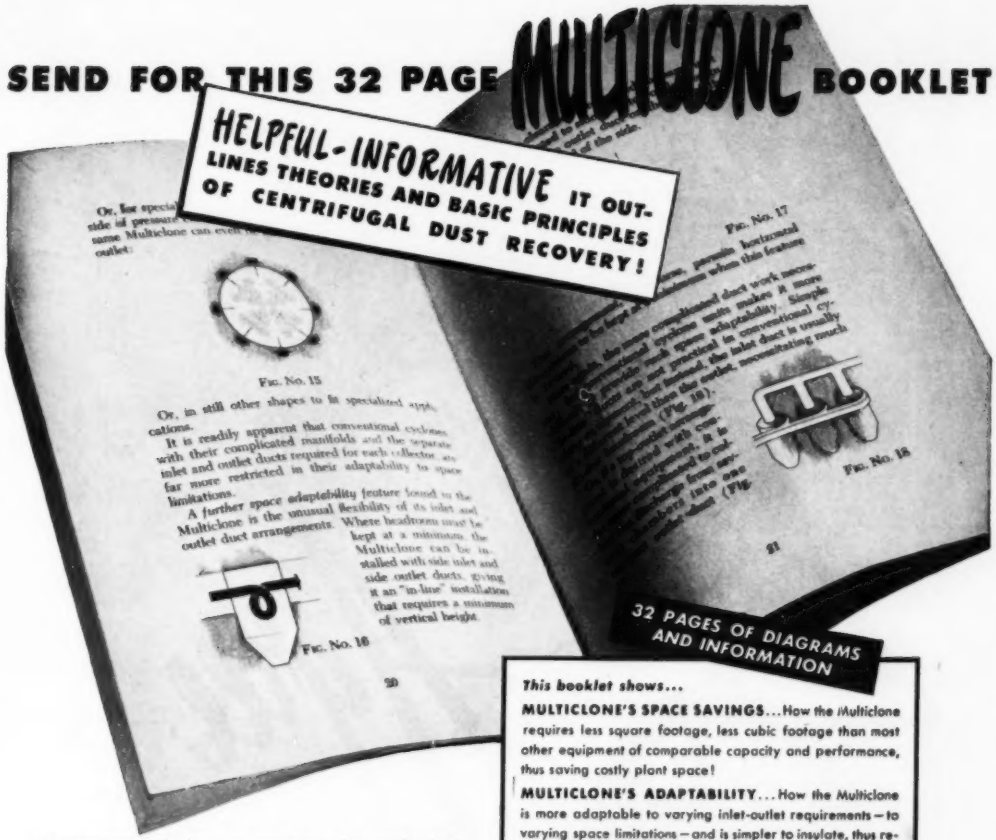

NO MATTER whether you are now using mechanical dust recovery equipment or are planning the installation of such equipment at some future date, here is a booklet that is full of helpful and valuable information on centrifugal dust recovery. It not only explains the basic methods and principles involved, but also shows the important differences between small and large diameter separating tubes, shows how to simplify your duct work and reduce installation costs, and outlines many other important factors to be considered in selecting mechanical dust recovery equipment.

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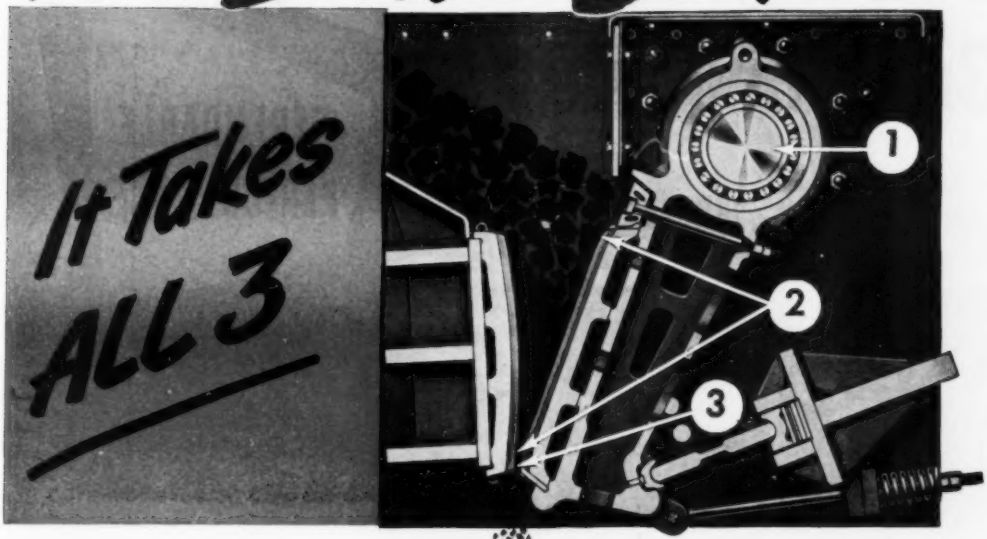

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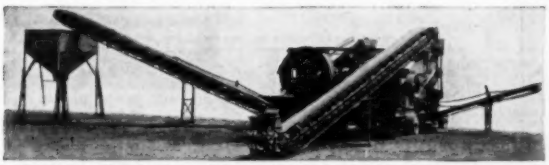

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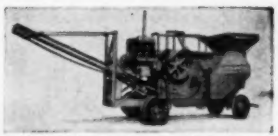

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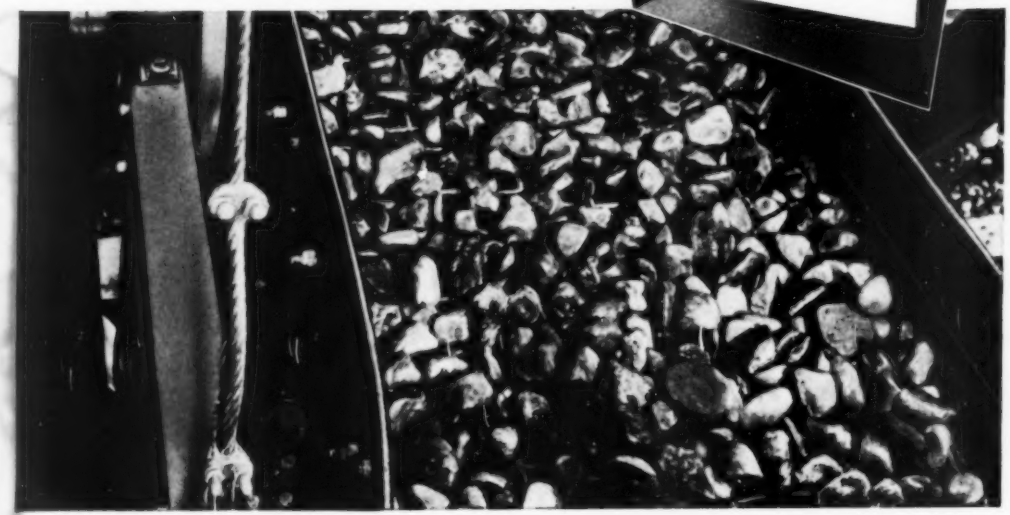

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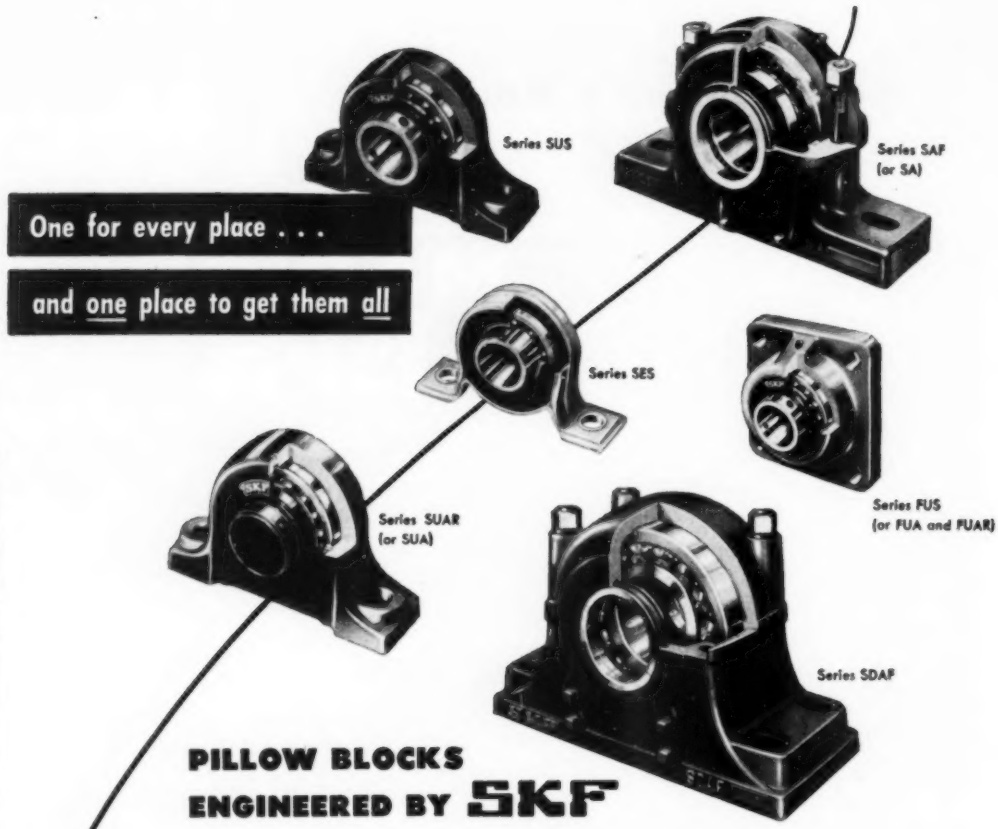

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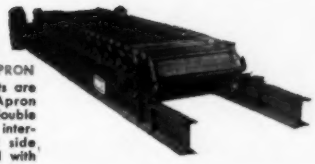

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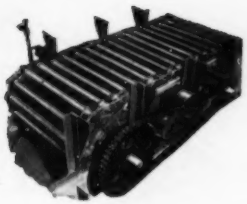

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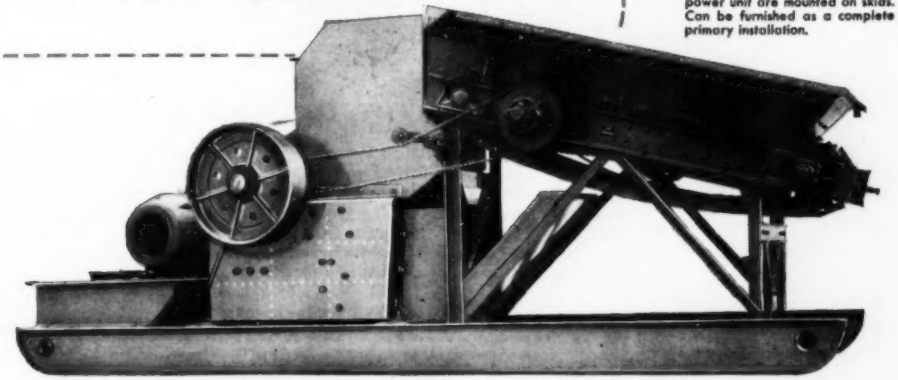

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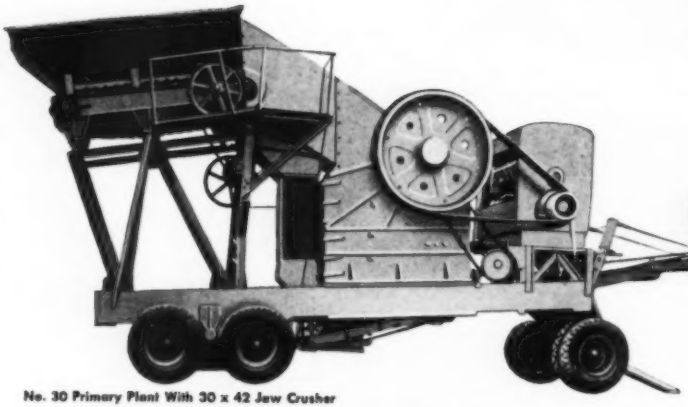
11 SIZES



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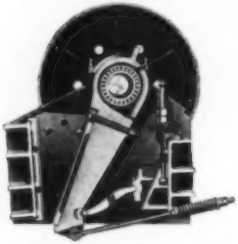
. . . for every CRUSHING NEED!



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- ✓ Reversible jaws for maximum service life.
- ✓ Easy jaw adjustment even while crusher is operating.
- ✓ Movable jaw equipped with shock absorbing springs.

The Crusher is the key to your production volume—determines operating profit or loss. Consult Diamond engineers for the proper Crusher for your particular operation.

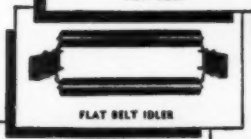
WRITE DEPT. P FOR BULLETIN D-51-D—TODAY

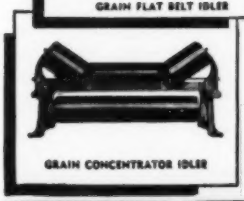
Everything. . . for the aggregate producer

DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.
1766 N. 2ND STREET, MINNEAPOLIS 11, MINNESOTA

THERE'S A *Continental* IDLER for every purpose





Belt conveyors are used for handling many types of material. For this reason, Continental manufactures a variety of Idlers, each designed to best take care of a particular application.

When ordering your next Belt Conveyor, specify Continental Idlers and take advantage of our complete line.

Most standard size Idlers can be shipped FROM STOCK. Other sizes can be shipped promptly.

Specify Continental

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS

SPEED UP HANDLING JOBS

with Bethlehem Braided Slings

If some of your lifting and moving jobs are crying for faster action, Bethlehem strongly suggests that you consider braided slings.

This type of sling has the very real advantages of high flexibility, resistance to kinking, and general ease of handling. All these factors contribute to speed in rigging and a faster flow of material. Then, too, Bethlehem braided slings are "huggers"—fit snugly around the contours of the load—and they can be made in sufficiently large sizes to have tremendously high strengths.

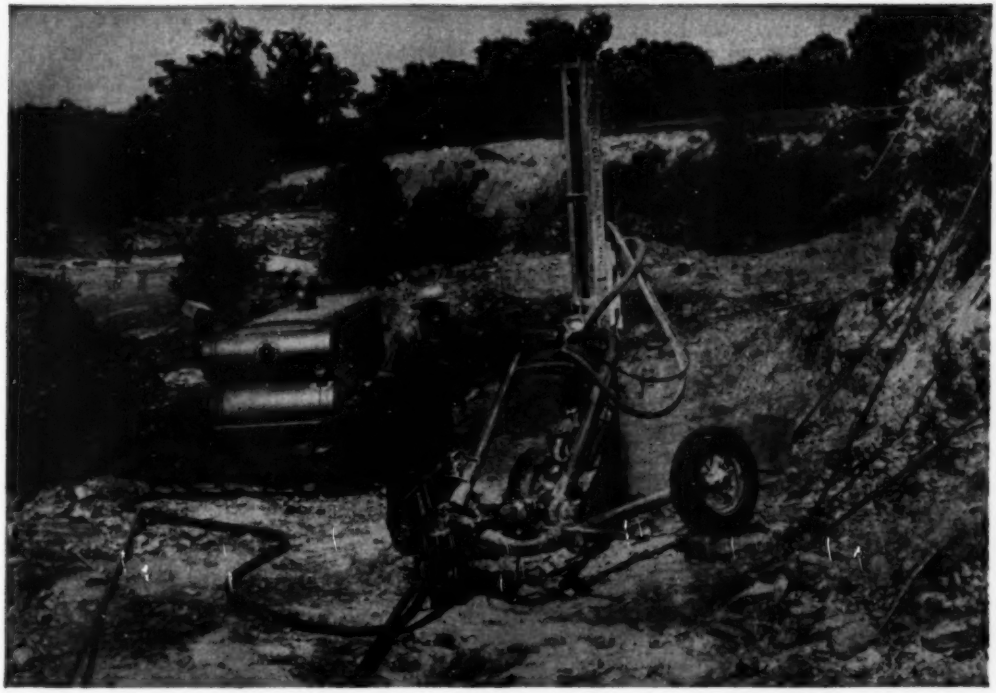
Of course, the braided sling is but one of the many choices that Bethlehem makes available. If you feel that your needs are better served by a nonbraided type—either standard or special—our plant can readily handle your order to specifications. Remember: we are fully set up to furnish *every* class of sling, and our designing and manufacturing units are unsurpassed anywhere in the country.

Here's a suggestion: send us your prints, drawings, or sketches showing the kind of handling problem you have in mind. Braided slings may well be the answer; but if another type seems more logical for your application, we'll tell you so frankly. Before you take this step, however, you may prefer to look over our slings catalog. Ask for a free copy; it will be mailed promptly.

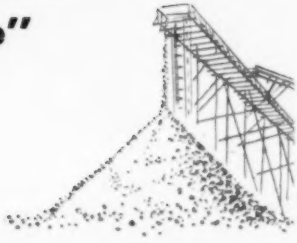
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★



you'll *WIN* a bigger "pile" *FASTER*

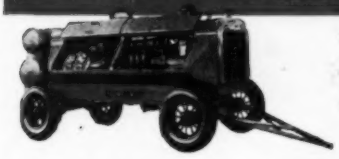


Gardner-Denver equipment helps you eliminate lost minutes — gives you a good chance to speed up quarry production — at a lower cost per ton.

GARDNER-DENVER WAGON DRILLS

have extra power to keep the bit drilling in a tight hole — extra wind to clean cuttings from the deepest hole. Long steel changes reduce steel handling time. Convenient controls increase operator efficiency. Easily adjustable — quickly rolled into position for spotting the hole right where it will give best breakage.

GARDNER-DENVER PORTABLE COMPRESSORS



are fully water-cooled — *all* the way down the cylinder — for all-weather dependability. Two-stage compression assures full capacity for top drilling power at any altitude. High efficiency air cleaners — positive lubrication on uneven ground. Write for additional information.

SINCE 1859 **GARDNER-DENVER**

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

Speed-Power-Guts- Thew TL 25 Lorain

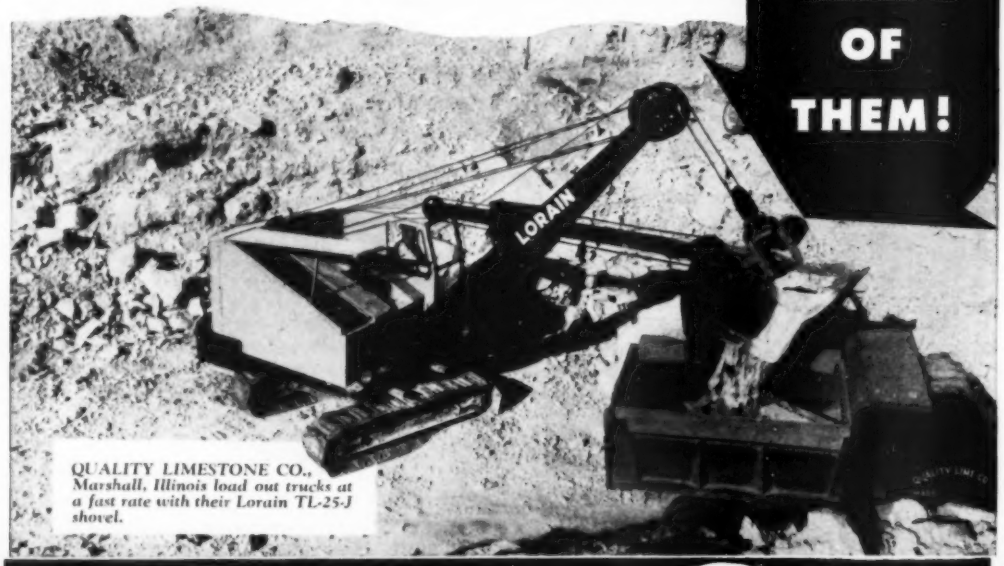
Lorain TL-25 machines have all of these important profit-making qualities . . . *SPEED* — responsive clutches and rapid acceleration save seconds per trip, and more trips per day mean more yardage . . . *POWER* — abundant power from a "plus" engine is delivered by a high-efficiency transmission to just where you want it, when you want it . . . *GUTS* — if you mean ability to take punishment and to hang-on relentlessly until the job is done, "TL-25's" have it . . . or if you mean the "insides" of the machine, "TL-25's" again have it in advanced design and construction that give you these features . . .

• IT'S A COMPLETE PACKAGE—NO EXTRAS TO BUY • INTERCHANGEABLE "PACKAGED" COMPONENTS—FAST, EASY TO SERVICE • 5 IDENTICAL CLUTCHES • ONE-PIECE BED • OIL-ENCLOSED CUT GEARS • INTERCHANGEABLE PARTS • ANTI-FRICTION BEARINGS • HOOK ROLLERS • QUIET, SMOOTH OPERATION • 7 MODELS TO CHOOSE FROM—3 CRAWLERS (STD., EXTRA-LONG OR EXTRA-WIDE) AND 4 RUBBER-TIRE MOUNTINGS

Your nearest Thew-Lorain Distributor can show you these TL-25 features at work!

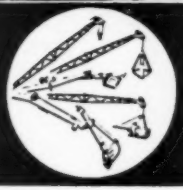
THE THEW SHOVEL CO., LORAIN, OHIO

HERE'S 3/4 YARDS OF THEM!



QUALITY LIMESTONE CO., *Marshall, Illinois load out trucks at a fast rate with their Lorain TL-25-J shovel.*

THEW **LORAIN**® *on CRAWLER or RUBBER*



SHOVELS
CRANES
DRAGLINES
CLAMSHELLS
HOES

in WIRE ROPE, too

It's all in the RIGHT KIND of Muscle

The powerful, rugged muscles of a charging rhino enable him to propel his tremendous bulk and weight at truly remarkable speed. Nature designed them well for the purpose they have to serve.

In wire rope, too, the right kind of muscle is vitally important... because different types of jobs present different types of destructive forces. Bending fatigue! Shock stress! Abrasion! Load strain! Each demands wire rope that best combines the required resistance characteristics.

Wickwire Rope gives you the benefit of long experience and specialized know-how which assures you of exactly the right kind of rope your particular job demands.

For additional information write or phone our nearest sales office.

WICKWIRE ROPE
A CF&I PRODUCT

LOOK FOR THE YELLOW TRIANGLE ON THE REEL

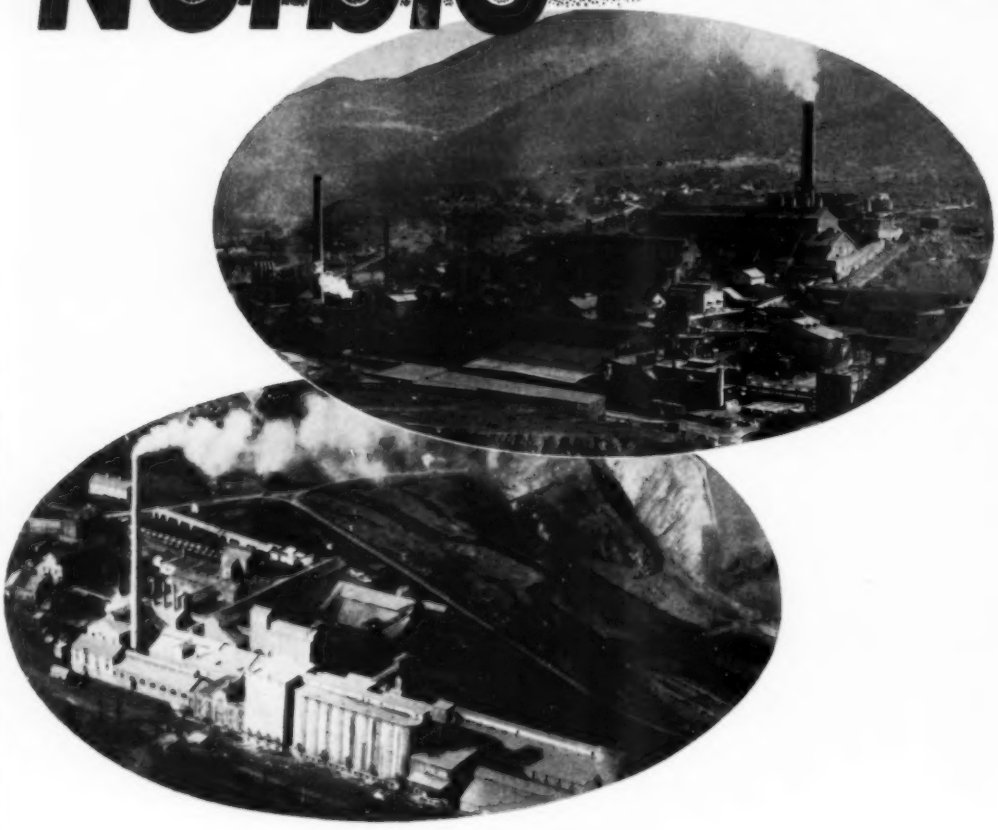
EAST: WICKWIRE SPENCER STEEL DIV.—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • Philadelphia • New York
WEST: THE COLORADO FUEL & IRON CORP.—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST: THE CALIFORNIA WIRE CLOTH CORP.—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane

WICKWIRE ROPE

CF&I

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL & IRON CORPORATION

Norblo



Efficient, Economical Dust and Fume Collection...

78 cylindrical bags, totalling 936 square feet of free cloth area are the basic unit of Norblo Automatic Bag Type Dust Collectors. Bag cleaning, one unit at a time, takes only a few seconds, the air flow being reversed during the shaking. Thus Norblo operates continuously at full rated capacity of the cloth area. Timing can be adjusted to dust load changes without shutting down.

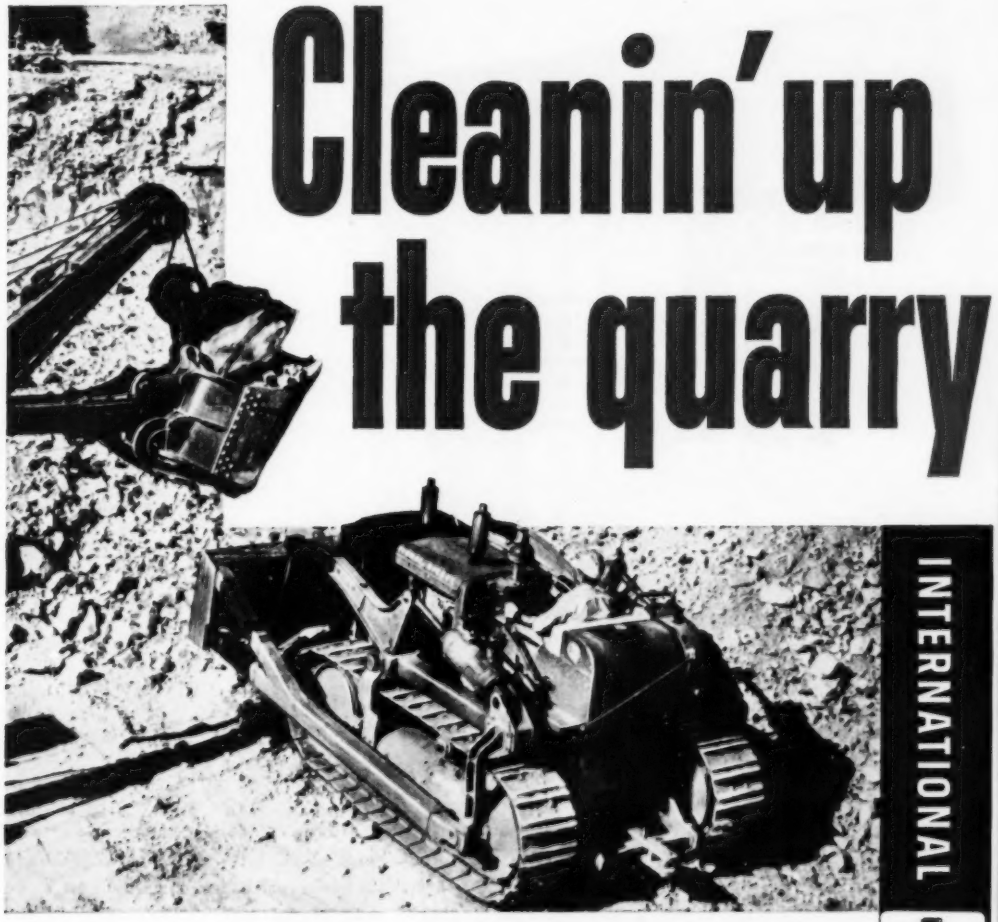
Norblo automatic dust and fume collection systems are built for continuous heavy duty service at low cost. Maintenance is simple. More than 30 years of experience in cement and rock products, mining and smelting are assurance of dependable star performance. Write for Bulletin 164-2.

THE NORTHERN BLOWER COMPANY

Engineered Dust Collection Systems for All Industries

6407 BARBERTON AVE. • CLEVELAND 2, OHIO

Cleanin' up the quarry



INTERNATIONAL

Arnold Graf's International TD-18 keeps production high, costs low in Molino, Missouri, quarry

Arnold Graf, Molino, Missouri, bought an International TD-18 crawler as production insurance for his limestone quarry two years ago. Here's what has happened since:

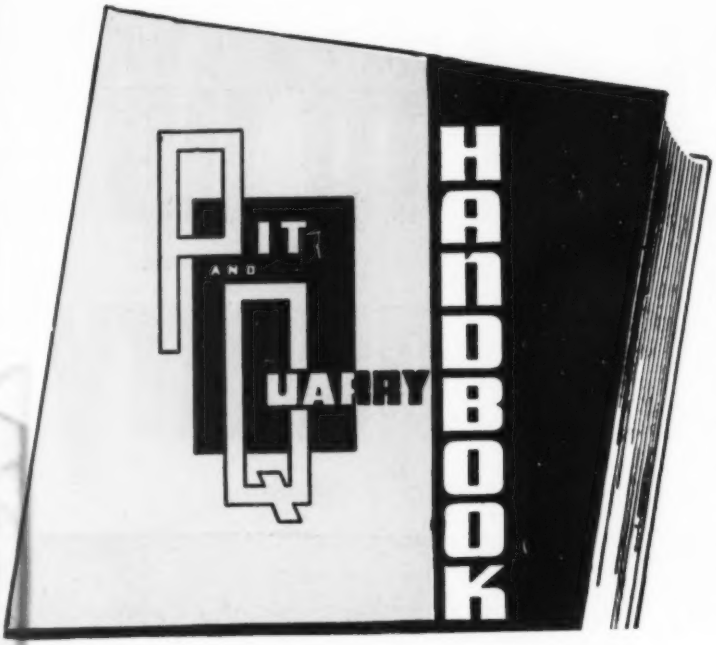
With the TD-18 doing everything from dozing 15-foot overburden to feeding the shovel and cleaning up the quarry floor, production zoomed to 700 tons a day. The crawler's 1,600-hour work record shows no downtime and no repairs.

POWER THAT PAYS

"We recommend the TD-18" says Mr. Graf, "to anyone with a tough piece of work to do. It has given us excellent service while doing the dozens of quarry jobs only this powerful crawler does best."

International crawlers defy the grit in your pit or quarry and give you greater production per power dollar. Ask your International Industrial Distributor for all the facts, including his after-sale policy. Then go ahead with International "Power that Pays!"

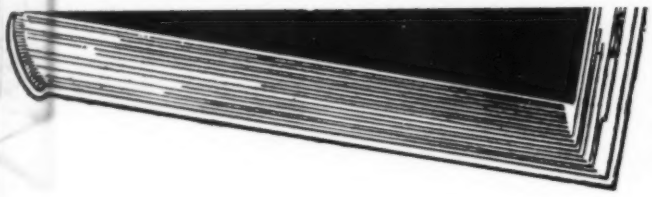
INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



An Indispensable Tool For Both Operator and Supplier of Equipment

The pit-and-quarry industries, in providing important basic raw materials, bear a large share of the responsibility for the success of America's industrial effort. For the producer the revised Technical Section of the 1951 Handbook provides a ready answer for many of his operating problems. For the concern supplying him with the machinery and equipment necessary to produce his materials, the 1951 Directory Section provides an accurate, up-to-the-minute list of all known producers of nonmetallic minerals and their products. No effort or expense has been spared to make the new Directory an efficient and highly useful source of information about producers. The number of changes made in the 1951 edition runs into the thousands.

1951 Edition—Order Now



Directory Section listings appear two ways — (1) alphabetical by companies, (2) geographical by plants. You get company names, officers, location of plants, their capacity, and the names of the men who do the buying.

Pit and Quarry Publications
538 South Clark Street, Chicago 5, Illinois

Date .....

Please send me

—copies of the 1951 Handbook and Directory bound together at $15.00

—copies of the 1951 Directory bound separately at $15.00

☐ Check is enclosed

☐ Mail me the bill

Name ..... Title .....

Company .....

City ..... Zone..... State .....

Every Air Hose With This Trademark

Assures Long Operating Life

Air hose economy is not measured in feet per dollar. The only true yardstick of air hose value is *service hours.*

Because every BWH hose has been developed, tested and field-proven to give the best possible combination of strength, safety, flexibility and damage resistance . . . *you get maximum service life.*

Whatever brand of hose you are now buying, you are paying for BWH benefits — so why not start getting them — *now?*

Today, contact your nearby BWH Distributor.

CONCORD AIR

An extra quality, exceptionally rugged hose for toughest use on air drill and pneumatic service in mines, quarries and construction jobs. Non-porous tube resists heat and oil. High tensile cotton yarn braid reinforce carcass. Tough grey cover resists cutting, gouging, abrasion. Made in ½" 2-braid and ¾" 2-braid sizes. 200 to 300 lbs. working pressure. Maximum length 50'.

BAY STATE AIR DRILL

For heavy construction work in mines, quarries, tunnels and wherever large size hose is required for long service. Smooth black tube resists heat and oil. Carcass of strong, rubber-impregnated multiple ply woven duck. Rugged, heavy-gauge red rubber cover resists severe weather extremes, cutting, abrasion. 9 sizes stocked from ½" to 4". Working pressures from 175 to 225 lbs. Maximum length 50'.

AUROCHS AIR

For portable air compressors, jackhammers, rugged industrial and construction work. Smooth, black, non-porous tube resists heat and oil. Carcass: multiple ply, rubber-impregnated, rugged woven fabric. Tough black cover resists weather and abrasion. Stocked sizes: ½", ¾", 1", 200 lbs. working pressure. Maximum length 50'.

VIM AIR

For general industrial use, on compressors and pneumatic tools. Black tube resists oil and heat. Husky cotton yarn braids. Smooth, red cover resists weather, abrasion. 8 sizes stocked, ¼" 2-braid to 1" 3-braid. Working pressures 150 to 225 lbs. Maximum length 500'.

BULL DOG VARI-PURPOSE AIR

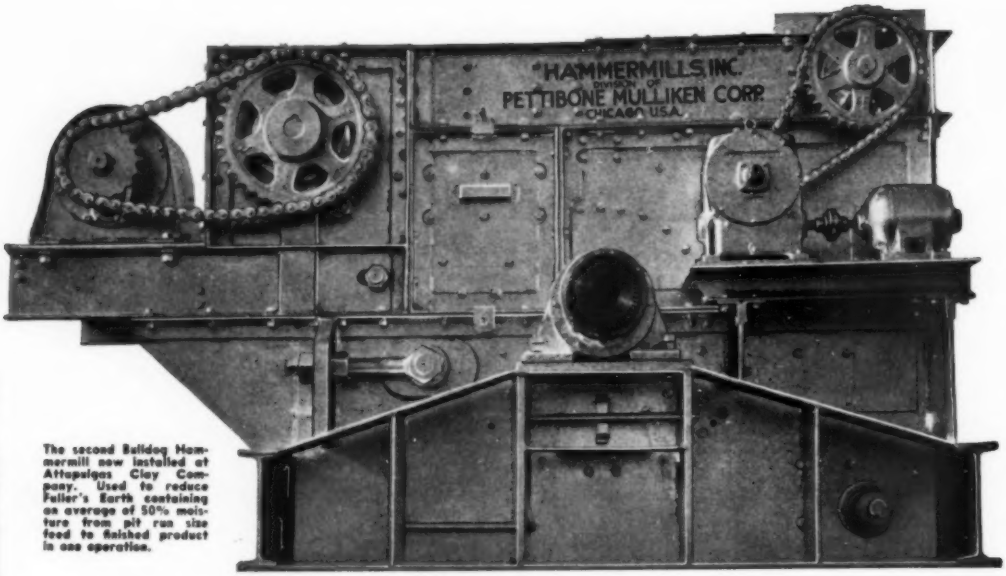
For a variety of jobs including handling of air, water, oil, gasoline, kerosene (not for paints, lacquers, lacquer-solvents). Black, synthetic tube resists oil and heat. Carcass is braided rayon cord, high strength, super flexible. Smooth, brown, tough synthetic cover resists oil, abrasion, sunlight. 11 sizes stocked from 3/16" one-braid to 1" 2-braid. Working pressures: 200 to 300 lbs. Maximum length approximately 500'.

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS.

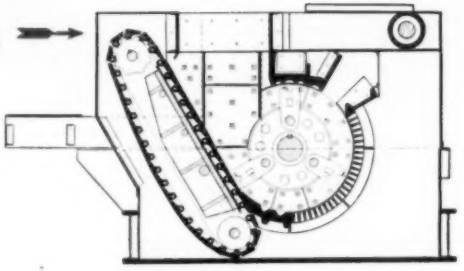
P. O. BOX 1071, BOSTON 3, MASS., U. S. A.



The second Bulldog Hammermill now installed at Attapulgus Clay Company. Used to reduce Fuller's Earth containing an average of 50% moisture from pit run size feed to finished product in one operation.

BULLDOG HAMMERMILL

with Moving Breaker Plate



For wet, sticky material reduction . . . for those tough, heavy-duty crushing jobs.

Illustrated above is the last word in Moving Breaker Plate Hammermill design. It is built by an engineering organization whose experience far surpasses any organization that might furnish Moving Breaker Plate crushing equipment.

Design Improvements have increased reduction efficiencies and lowered H.P. requirements. You can see this equipment in operation at any time. Also Hammermills will gladly survey your reduction requirements and recommend the proper equipment without cost or obligation. Just write or call.

Bulldog Hammermills are built in capacities up to 1000 tons per hour for every purpose: for primary, secondary, fine reduction of materials such as limestone, shale, Fuller's Earth, phosphate muck, phosphate mud balls, iron ore, oyster and clam shells, any reducible material.

HAMMERMILLS, INC. *division of* **PETTIBONE MULLIKEN CORP.**

4759 W. Division St. Chicago 51, Illinois Phone SPaulding 2-9300

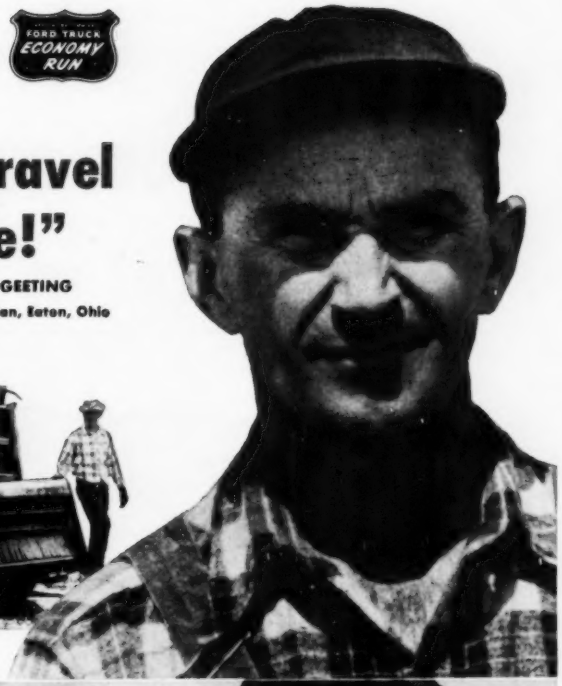
OHIO
Report No. 8267

FORD TRUCK ECONOMY RUN

"We haul

Over 6 tons of gravel for only 3¢ a mile!"

—says ROY GEETING
Construction Man, Eaton, Ohio



"My Ford Dump Truck saves me money every mile," says Mr. Geeting. "I save about a dollar a day or almost 300 dollars a year on gasoline alone!"

Contractor Geeting uses his 1950 Ford F-6 Dump for all kinds of roadwork (i.e., hauling sand and gravel, sanding hills, plowing snow). He says, "It's the ideal truck for cramped quarters because it steers and handles so easily."

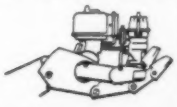
He entered his truck in Ford's nation-wide Economy Run and says: "My Ford traveled 21,003 miles with loads of over 6 tons. Yet it cost only $637.83 for gas, oil, maintenance and repairs. That's a running cost of only 3.04 cents a mile!"

Like others who rely on Ford for low running costs, Roy Geeting is sold on the money-saving service he gets from his Ford Dealer. For more facts on the trucks that last longer *and* save you money every mile—mail coupon below.

This Ford F-6 Dump for '51, like Mr. Geeting's truck, is a favorite with construction haulers. Power choice of 3 great engines . . . 100-h.p. V-8, 110-h.p. Big Six and 95-h.p. Six. Available with the 5-STAR Cab, or, at added cost, the 5-STAR EXTRA Cab for more efficient driving, safety and convenience. Single speed rear axle standard, 2-speed axle also available (at extra cost) with wide range of ratios for operating flexibility.

Availability of equipment, accessories and trim as illustrated is dependent on material supply conditions.

POWER PILOT HELPS CONSTRUCTION MEN HOLD DOWN HAULING COSTS



The Ford Truck Power Pilot is a simpler, fully-proven way of getting the most power from the least gas. It is designed to synchronize firing *twice* as accurately.

You can use regular gas . . . you get no-knock performance. Only Ford in the low-price field gives Power Pilot Economy.

FORD TRUCKING COSTS LESS

because FORD TRUCKS LAST LONGER!

Using latest registration data on 7,318,000 trucks, life insurance experts prove Ford Trucks last longer!

SEE "FORD FESTIVAL" STARRING JAMES MELTON ON NBC-TV

MAIL THIS COUPON TODAY!

FORD Division of FORD MOTOR COMPANY
3253 Schaefer Rd., Dearborn, Mich.

Send me without charge or obligation, detail specifications on Ford Trucks for 1951.

Full Line ☐ Heavy Duty Models ☐
Light Models ☐ Extra Heavy Duty Models ☐

Name_____
(Please print plainly)

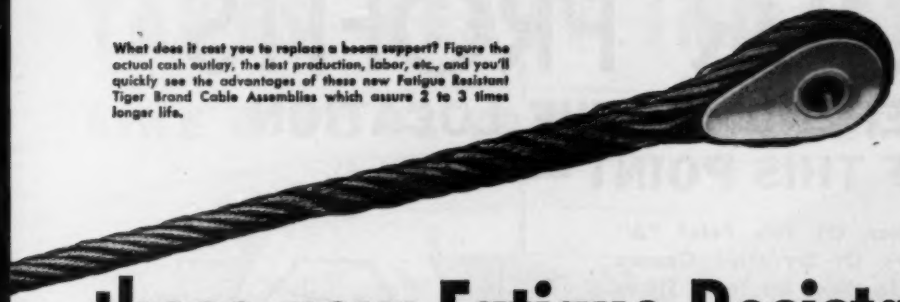
Address_____

City_____ Zone____ State____

Check here if student ☐

Your boom support costs can be cut in half with

Vibration is effectively dampened here. Note how the interwoven end dampens vibration over a long section of rope instead of concentrating it at one point.



What does it cost you to replace a boom support? Figure the actual cash outlay, the lost production, labor, etc., and you'll quickly see the advantages of these new Fatigue Resistant Tiger Brand Cable Assemblies which assure 2 to 3 times longer life.

these new Fatigue Resistant TIGER BRAND Cable Assemblies

***An exclusive development of* AMERICAN STEEL & WIRE COMPANY**

Why these boom supports last 2 to 3 times longer. Excessive vibration is the chief cause of boom support failure. In old style boom supports, vibration is concentrated at the *point* where the rope enters the socket. This causes the wires to break from fatigue. In this new assembly, the effects of vibration are dissipated over a long section instead of being concentrated at one point. The result is two to three times longer life for boom supports and much greater safety.

The new Tiger Brand Assembly has a novel design which embodies *interwoven* eye-end and open-end thimbles which makes these pendants easily and quickly interchangeable on standard equipment.

You also save replacement time. If the machine is down for two or three hours while new boom supports are being installed, you lose that much production time. Longer life from our new supports *results* in fewer replacements. This means clear profit if you use the new Tiger Brand Supports.

Order your next boom supports now. The new Fatigue Resistant Boom Supports can be easily and quickly adapted to your present equipment because essential dimensions such as pin diameters, distances between ears, etc. are the same as for standard open and closed sockets. Send the coupon for complete information.

AMERICAN STEEL & WIRE COMPANY,
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM,
SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

American Steel & Wire Company
Rockefeller Building, Dept. H-9
Cleveland 13, Ohio

Please send me complete information on your new Tiger Brand Boom Support Assemblies.

Name.....

Title.....

Company.....

Address.....

City.....State.....

USS

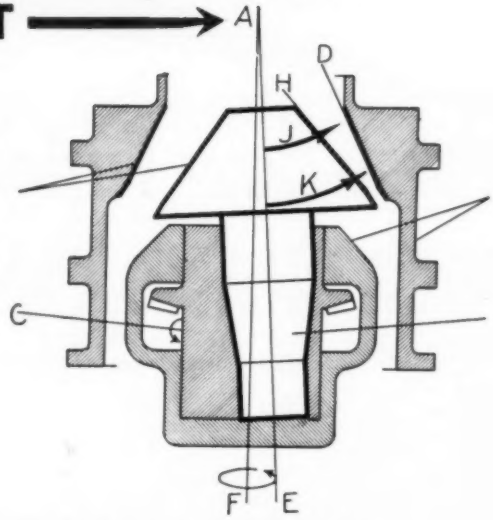
AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

YOUR PROFITS

DEPEND ON THE LOCATION OF THIS POINT →



Incorrect Location Of This Point "A" Called *The Apex Of Gyration* Causes Crushing Faces To Wear Up To 10 Times Faster!

Just see how easy it is for this excessive wear to take place. For example a crusher running at 350 strokes per minute 8 hours a day, 22 days per month and you get 3,696,000 strokes per month. Any machine that crushes with a rubbing motion and repeats this error this many times a month is bound to wear away crushing faces rapidly and waste power.

(All gyratories *EXCEPT KUE-KEN* crush with a rubbing motion)

Now see how Kue-Ken design has eliminated any possibility of rubbing by locating this point "A" or Apex of Gyration in the correct location with respect to the crushing faces.

This Apex point exists in every crusher of the true gyratory type whether the machine has a shaft bearing above the crusher head or below. It is from this Apex point that the crushing head must swing and all parts of the crushing faces must follow the path of an arc struck from the Apex point. Such arcs are shown at J and K.

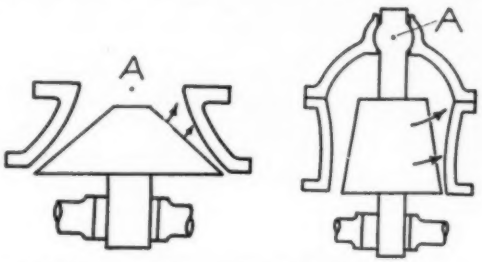
Check them with a compass. Note how squarely these arcs pass through the crushing zone. Rock is instantly gripped and crushed between the crushing faces without slipping or rubbing—is not forced upwards, thereby reducing wear and power to the minimum and increasing output to the maximum. Outstanding in performance and smooth in action, the KUE-KEN GYRACONE is proving daily to its users that it crushes faster and finer at less cost per ton—delivers a more uniform product with less wear on the crushing faces.

Let Kue-Ken Gyracone Crushers Increase Your Profits Now

California (Southern)—Migula & Co., Pasadena
Montana—Caird Engineering Works, Helena
Texas—Engineered Sales Co., San Antonio
Utah—Lund Machinery Co., Salt Lake City
Washington—
Seattle, Washington Machinery and Storage Co.
Spokane, Construction Equipment Co.

*Pronounced Que-Ken. U.S. and Foreign Patents Pending.

KUE-KEN CRUSHING PRINCIPLE
Place a pencil compass at point "A". Describe arcs J and K. Note how squarely these arcs pass thru the crushing zone.
No Slip — No Rub — No Upward Motion



Crushing Machines with Rubbing Motion Check from Point "A" with a Pencil Compass

448 CHESTNUT ST. • OAKLAND 20, CALIFORNIA

STRAUB MFG. CO.

Kue-Ken Balanced Crushers	Rib Cone Ball Mills	Overflow Classifiers
Kue-Ken Simplex Crushers	Concentrating Tables	Feeders
Kue-Ken Gyratory Crushers	Overhead Eccentric Crushers	Screenwheel Classifiers

Pennsylvania Crusher Co., Exclusive Licensed Eastern Manufacturer and Distributor Broad and Arch Streets, Philadelphia, Pennsylvania.
Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd., Authorized Licensed Manufacturer and Distributor Close Works, Gateshead-upon-Tyne, England.

TAKES HEAVY IMPACT

LIKE A POOL TAKES A PEBBLE

Homocord CONVEYOR BELT

"We seldom see a cut or gouge in Homocord Conveyor Belts. And they consistently outlast other belts on heavy-duty installations."

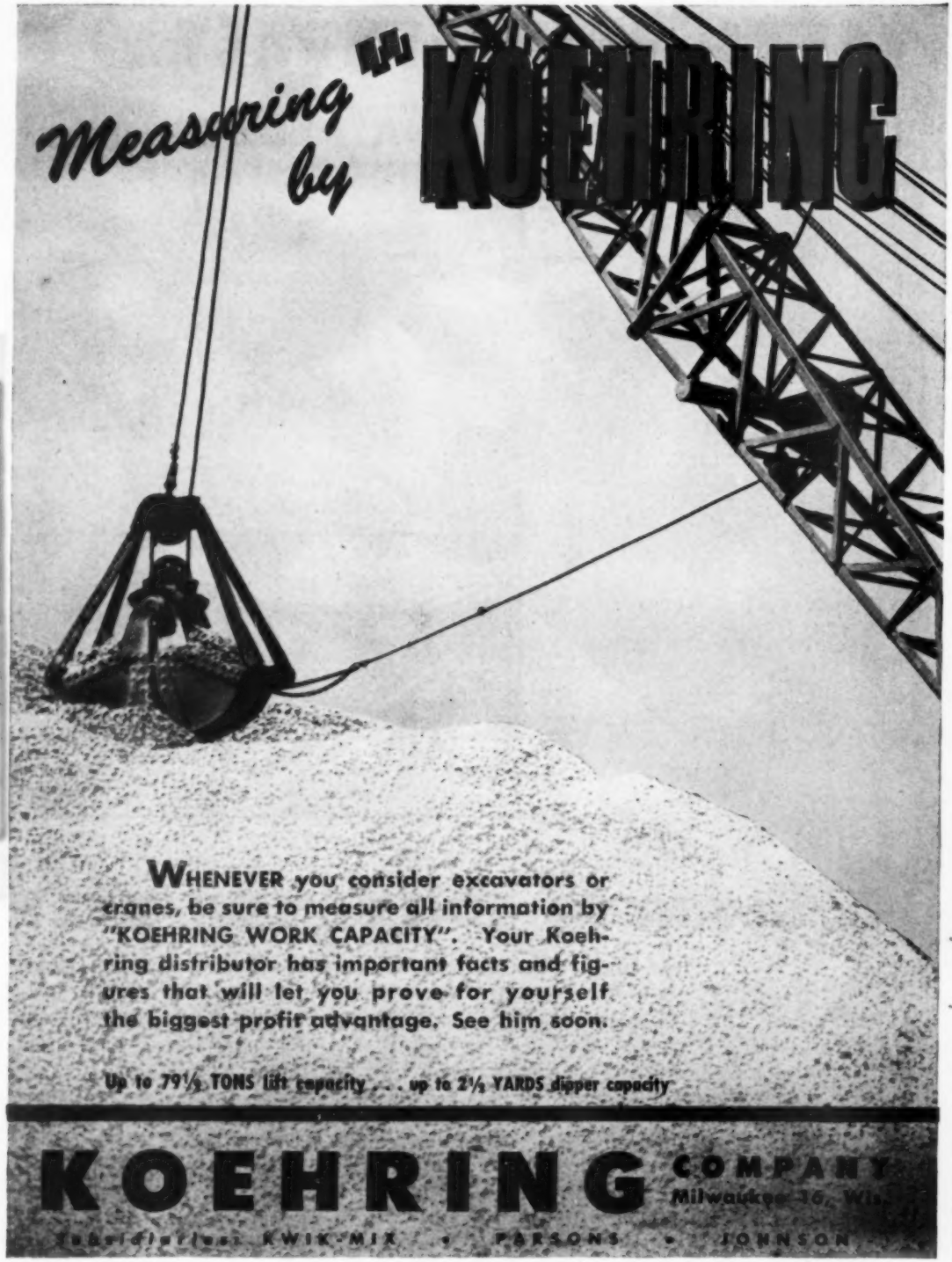
There are engineering reasons for this typical user report. The extra body-cushion built into Homocord dissipates the shock of sharp impact from large lumps of coal, ore and rock . . . assures long life. Natural troughing and flexibility add up to more ton-miles of materials carried.

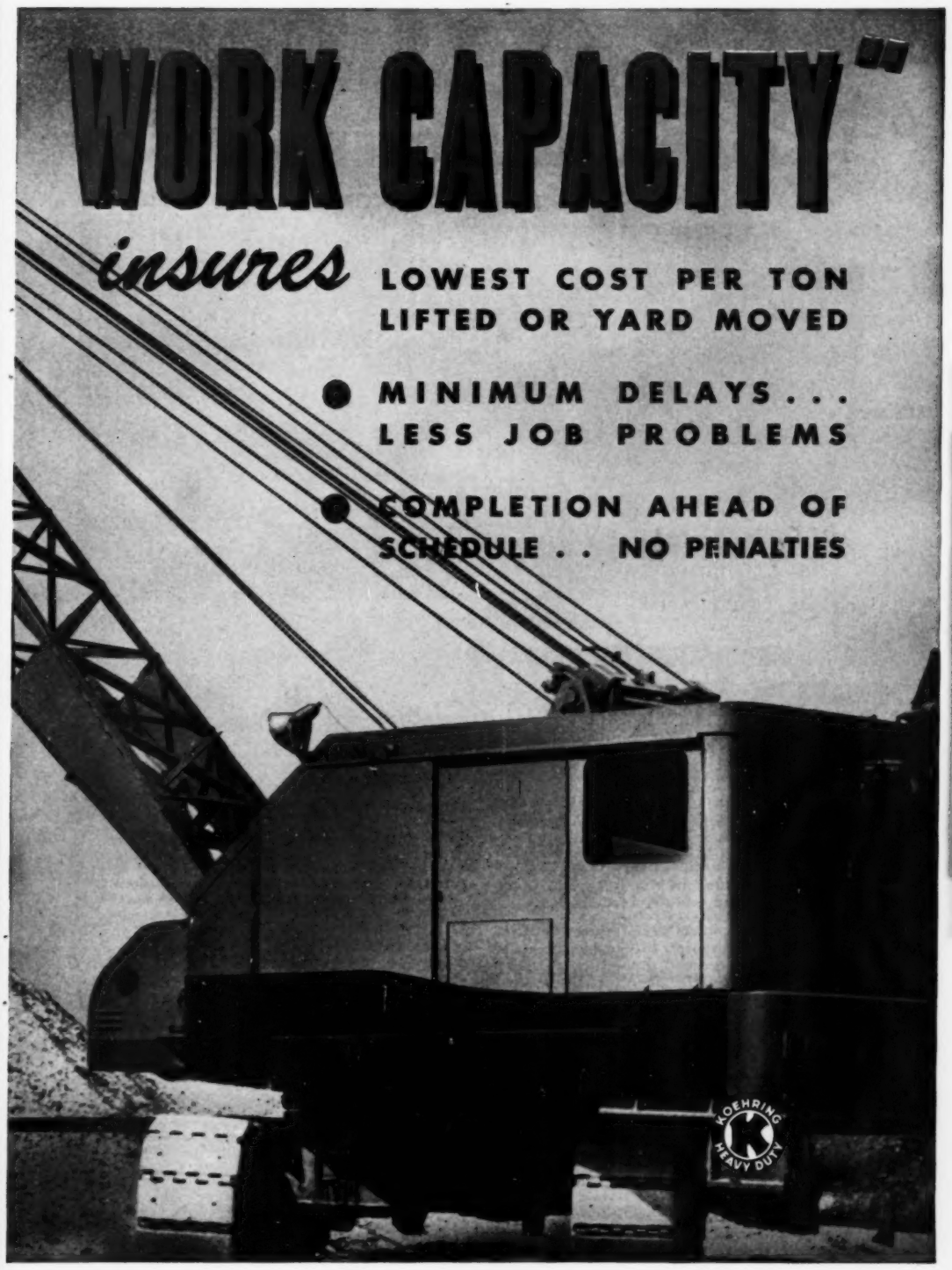
Full description of these and other advantages are described in Bulletin 6906. Let us send you a copy. You get the same long-life engineering in R/M hose, V-belts and flat belting. Ask your R/M representative.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

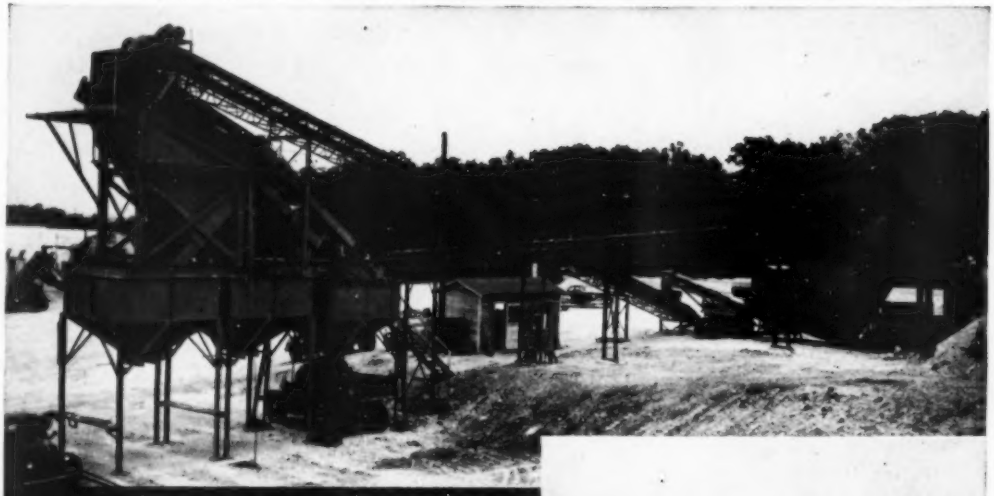
Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive and Diamond Wheels • Bowling Balls


Measuring by "KOEHRING"
WHENEVER you consider excavators or cranes, be sure to measure all information by "KOEHRING WORK CAPACITY". Your Koehring distributor has important facts and figures that will let you prove for yourself the biggest profit advantage. See him soon.
Up to 79½ TONS lift capacity . . . up to 2½ YARDS dipper capacity
KOEHRING COMPANY
Milwaukee 16, Wis.
Subsidiaries: KWIK-MIX • PARSONS • JOHNSON

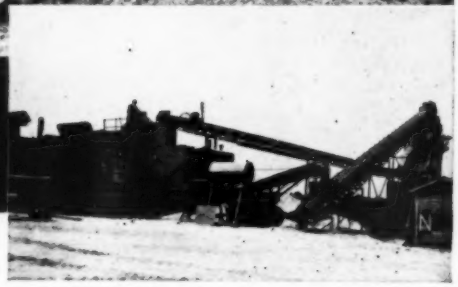

WORK CAPACITY"
insures
LOWEST COST PER TON LIFTED OR YARD MOVED
MINIMUM DELAYS . . . LESS JOB PROBLEMS
COMPLETION AHEAD OF SCHEDULE . . NO PENALTIES
KOEHRING
HEAVY DUTY

CONTROLLED IMPACT ACTION PAYS OFF for GALLAGHER & NELSON

on MADISON, WISCONSIN AIRPORT JOB



SINGLE 3240 IMPACT MASTER DOES COMPLETE CRUSHING JOB IN MODERN CLOSED CIRCUIT SETUP



Pays off with lower plant investment. High ratio of reduction eliminates secondary crushers and auxiliary equipment.

Pays off in better quality cubical product. 100% of the breaking is accomplished by rigidly mounted rotor hammers producing a high quality cubical aggregate.

Pays off with greater control over finished product size. Simple machine adjustments change the percentage of sizes in the finished product.

Pays off in less horsepower per ton. Average production of 150 tph. 2½" minus using less than 1 hp. per ton.

Portable 3240 Impact Master with 36" x 12' apron feeder, 30" delivery conveyor, powered by Murphy ME6 Diesel, 30" plant conveyor, 5' x 14' 3 deck vibrating screen, 18" return conveyor.

●

You can depend on Controlled Impact Action to PAY OFF for you. PMCO Impact Masters are available with capacities up to 500 tph. Write for complete job proved facts.

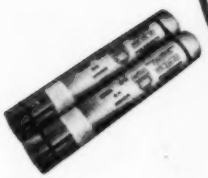
PETTIBONE MULLIKEN CORPORATION

4700 W. Division St., Chicago 51, Illinois **Phone Spaulding 2-9300**

1
2
3 see how easy it can be...

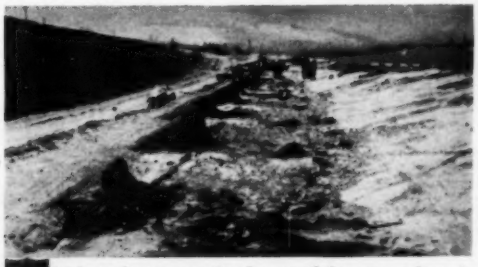
with AMERICAN'S new 25 pound container-cartridge

AMERICAN CYANAMID COMPANY
EXPLOSIVES



Fastened together in units of two each, these new twenty-five pound container-cartridges are unloaded quickly, ready to use immediately.

Without any of the wasted time or motion of older methods, American Explosive's new cartridge is loaded easily and directly into each hole.



Ready to shoot... note the clearness of the area, no boxes to clear away... the entire loading operation has been reduced to a minimum of time and labor.

And besides these special advantages you can rely on Cyanamid's American Explosives for *quality and dependability*, backed by strict laboratory control and modern methods of production.

For efficient, low-cost blasting results, make your next order American . . . available from plants and distributing magazines in key spots throughout the country.

Capable Field Engineers Are Available at Your Call

High Explosives • Permissibles • Blasting Powder • Blasting Accessories

AMERICAN Cyanamid COMPANY
Explosives Department
30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

SALES OFFICES: PITTSBURGH, PA. • BLUEFIELD, W. VA. • SCRANTON, PA. • CHICAGO, ILL. • POTTSVILLE, PA. • MAYNARD, MASS.

Jones

Herringbone SPEED REDUCERS

Single, double and triple reduction units cover every requirement in drives from 1 to 400 horsepower. Ratings and standard ratios from 1.25 to 1 to 355.8 to 1 are all shown in Catalog No. 70.

1890 60 YEARS 1950

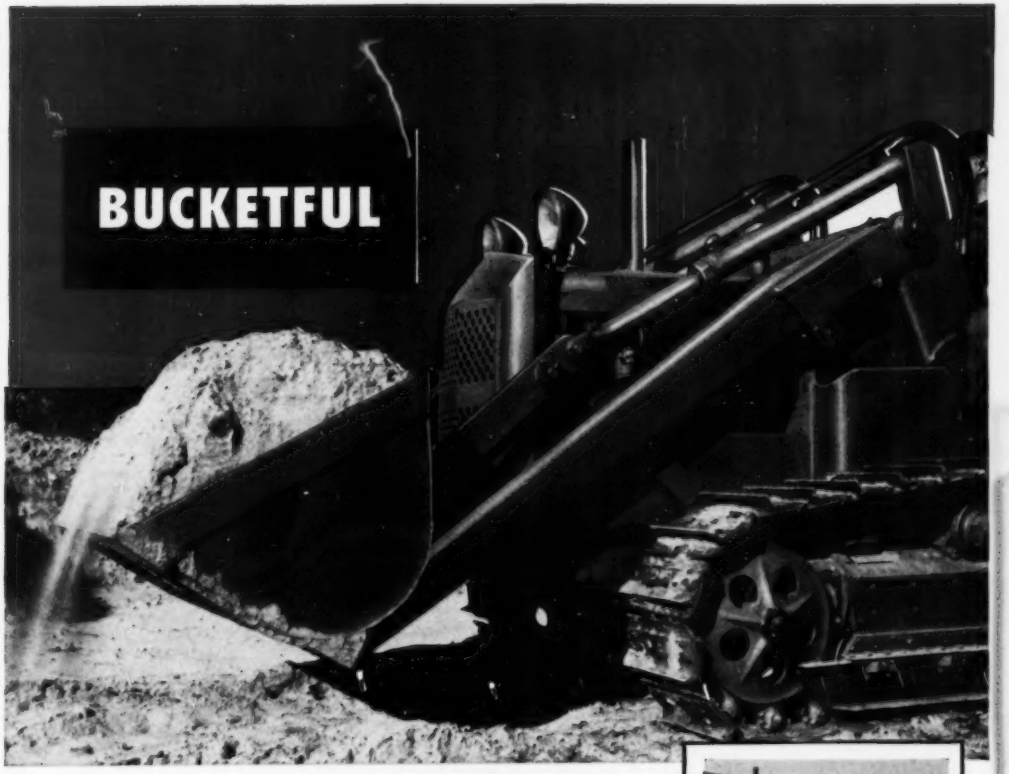
W. A. JONES FOUNDRY & MACHINE CO.
1441 W. Roosevelt Rd., Chicago 24, Ill.

Since 1890

Jones

In The Service Of Industry

HERRINGBONE — WORM — SPUR — GEAR SPEED REDUCERS
CAST IRON PULLEYS • CUT GEARS • V-BELT SHEAVES
ANTI-FRICTION PILLOW BLOCKS • FLEXIBLE COUPLINGS



# of Cost-Cutting Features

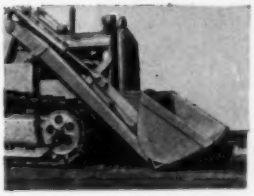
When it comes to cutting loading costs... stepping up profits, the Oliver Model "B" Crawler and Ware Loader is "loaded" with *plus* features.

Take the hydraulically controlled bucket, for example. 110° bucket rotation and 28° "tilt back" give you a full bucket every time. "Breaking out" action is 3 times the lifting effort of the loader... a particularly important advantage when loading out hard-packed material or for stripping operations. Bucket level is automatically maintained when lifting load, preventing wasteful spillage. You can control speed of discharge... fast or slow, easily and gently. And, even with the "tilt back" action, you still have a 32° (from vertical) dump angle... a control range no other loader can match. You get bigger loads... *faster!*

The Oliver-Ware "B" loader was designed and built exclusively for Oliver Model "B" tractors. Its ideal fit with the tractor eliminates unneeded dead weight and assures maximum stability for the entire unit. The Oliver semi-rigid axle allows limited oscillation of the track, eliminating the possibility of track-frame distortion. A hydraulic shock absorber smooths out pressure surges... prevents damage to loader and tractor parts.

For complete information on how the Oliver-Ware Model "B" tractor loader can cut costs for you, see or write your Oliver Industrial Distributor.

Plenty of power, plus the wide angle of bucket rotation, assures faster, more positive digging. 28° "roll back" assures maximum break-out action for a full bucket every time.

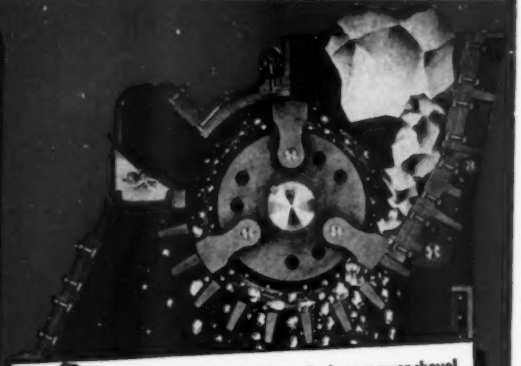


THE OLIVER CORPORATION

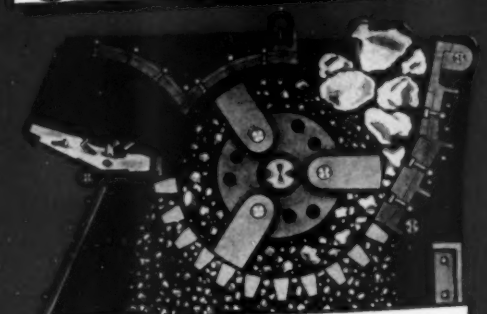
Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of industrial wheel and crawler tractors

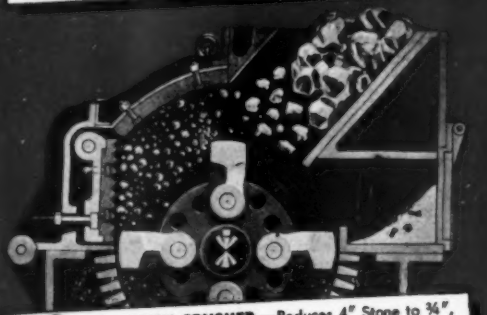
WILLIAMS HAMMERMILLS for the ~~2010~~ now 1-2-3 PUNCH in the CRUSHED STONE FIELD



1 **The "SUPER SLUGGER"**—Reduces power shovel loaded rock to 1½" or ¾" stone in One Operation. Capacities 65 to 550 tons per hour.



2 **The "SLUGGER"**—Reduces "one-man" size stone (75 to 100 lb. pieces) to 1¼", ¾" or Agricultural Limestone in One Operation. Capacities 4 to 100 tons per hour.



3 **The "NF" CRUSHER**—Reduces 4" Stone to ¾", ½" or Agricultural Limestone in One Operation. Made in a large range of sizes with capacities from 5 to 200 tons per hour.

You save operating costs because stone is crushed to desired size in one operation ... You save installation cost because you eliminate the need for additional machinery, foundations, conveyors, power drives and buildings.

WILLIAMS ALSO MAKES ...

Impact and Roller Mills for 200 to 325 mesh grinding; drier mills; air separators; vibrating screens; steel bins; complete "packaged" crushing and grinding plants.

USE OUR FREE TESTING LABORATORY

Submit your grinding problems to Williams. A sample of the material and description of the desired result will set our facilities to work on a solution to your problem. Visits during test runs and technical consultations are invited.

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
802 ST. LOUIS AVENUE — St. Louis 6, Mo.
WC-80-E

WILLIAMS

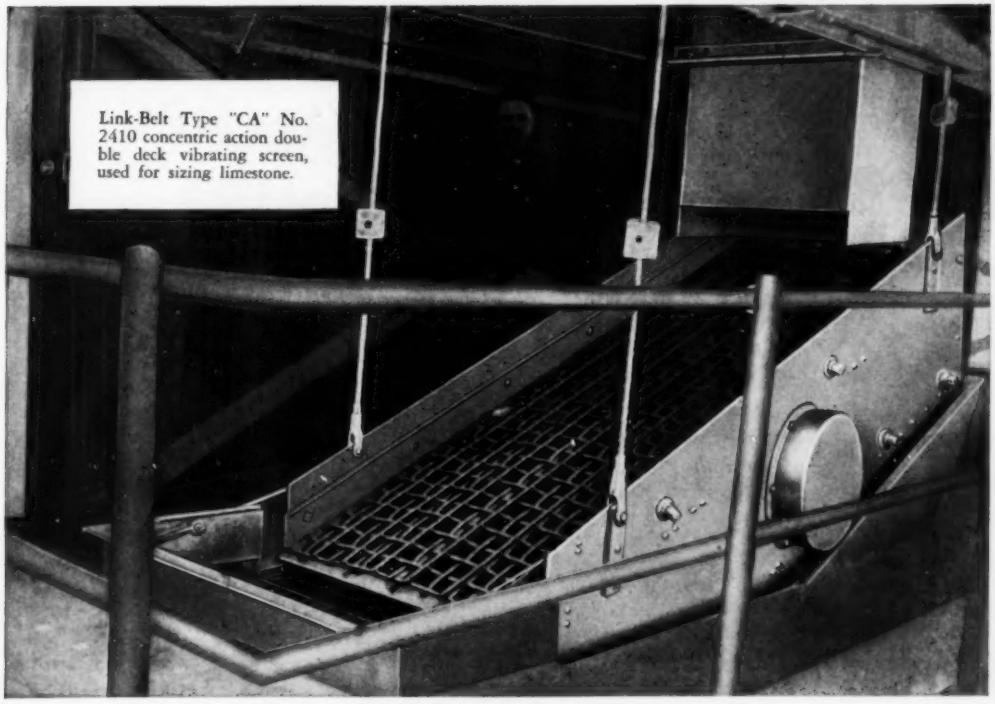
CRUSHERS — GRINDERS — SHREDDERS

OLDEST AND LARGEST MANUFACTURER OF HAMMERMILLS IN THE WORLD

No matter what your screening requirements . . .

the BETTER WAY is with CA

Concentric Action Vibrating Screens

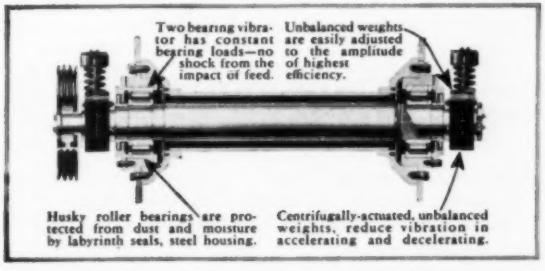


Link-Belt Type "CA" No. 2410 concentric action double deck vibrating screen, used for sizing limestone.

FOR accurate sizing . . . for thorough rinsing . . . for rapid dewatering—you can't beat the Concentric Action of Link-Belt's CA Vibrating Screens.

Flexible, rugged, efficient, economical—on all counts Link-Belt has more than matched top screening standards. Exactly what you would expect from the top name in the field of materials handling.

Link-Belt CA Vibrating Screens are available from 3 x 8 to 6 x 16 ft., single, double and triple deck, suspension or support mounted. Remember, when it comes to materials handling, profitwise operators come to Link-Belt.


Two bearing vibrator has constant bearing loads—no shock from the impact of feed.
Unbalanced weights are easily adjusted to the amplitude of highest efficiency.
Husky roller bearings are protected from dust and moisture by labyrinth seals, steel housing.
Centrifugally-actuated, unbalanced weights, reduce vibration in accelerating and decelerating.

WRITE FOR BOOK 2354
for complete layout data

LINK-BELT

VIBRATING SCREENS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities. 12.420-A

AGGREGATE

14,472 TONS!
The Peak Day's Production at Concrete Materials & Construction Co.
—Average Daily Production 600 TONS PER HOUR!

THIS CEDARAPIDS DOUBLE IMPELLER IMPACT BREAKER is really turning out the tonnage! On their New Jersey Turnpike contract, Concrete Materials & Construction Co. put through 14,472 tons of aggregate . . . 800 truck loads, at 16 to 20 tons per load . . . on their peak day, a 20-hour period when the surge pile was down and plenty of trucks were available for feed. *That's a 724 ton per hour peak production average!*

Originally scheduled to turn out around 400 tons per hour, the 5050 Double Impeller Impact Breaker in this Concrete Materials plant is consistently averaging more than 600 tons per hour. No wonder more and more contractors are depending on the bonus production of Cedarapids Double Impellers!

To meet today's demand for AGGREGATE UNLIMITED, and assure yourself of *opportunity unlimited* for profit, see your Cedarapids distributor today for the equipment you need to make *your* plant a real producer.

DOUBLE IMPELLER IMPACT BREAKERS

Get ready for the *big* jobs with a Cedarapids Double Impeller Impact Breaker in your plant. It's your assurance of maximum output of the cubical shaped aggregate required in so many specifications today. Because so much of the material is broken in suspension, you get an extremely high ratio of reduction at extremely low power costs. Exceptional tonnage with a minimum of connected horsepower! And you save on your plant set-up because you can eliminate much accessory equipment such as secondary crushers, conveyors, etc. You can get *immediate delivery* on Double Impeller Impact Breakers to give you OPPORTUNITY UNLIMITED right now! Four sizes available.

THE IOWA LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

UNLIMITED

for the New Jersey Turnpike

BINKLEY BROS. PLANT averages 250 to 300 tons per hour of 3½" minus material....

In the Bradford Hills Quarry near Downington, Pa., one 5050 Double Impeller Impact Breaker, owned by Binkley Bros., is taking quarry rock ... material passing a 50" opening ... reducing it to meet specifications for small sized cubical aggregate, *and doing it in one pass* at a rate of 250 to 300 tons per hour.

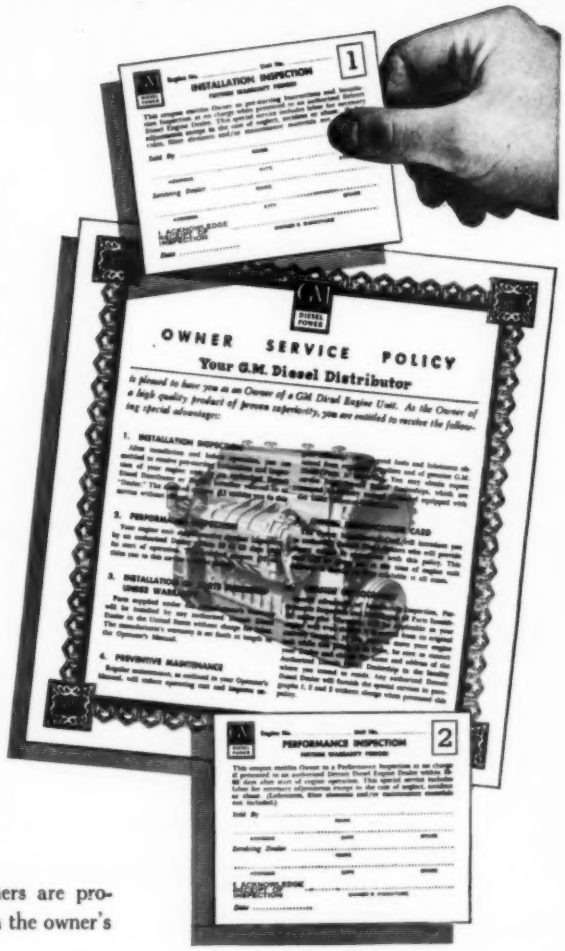
U. S. Pat. No. 2373691
2486421

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

Back of Your New

3 BIG SERVICE EXTRAS GM Diesel Power



We want every purchaser or prospective purchaser of one of our engines to know how his local GM Distributor and Dealer, with their factory-trained servicemen, stand back of the product. They in turn are backed by the knowledge that Detroit Diesel supports them strongly in their adherence to this policy.

1. *Installation Inspection:*

The GM Diesel serviceman inspects and checks the engine without cost to the owner; whenever possible this is done before the engine is put to work. He explains how to successfully operate the engine and the "preventive maintenance" necessary for best results in days to come.

2. *Performance Inspection:*

From thirty to sixty days after the engine has begun its job, another inspection is provided without charge. The GM Diesel serviceman makes any adjustments that may be required and tunes up the engine to its best performance.

3. *Owner's Service Policy:*

Besides the above inspections, GM Diesel owners are protected by the exceptional warranty mentioned in the owner's service policy.

ANSWER THE CALL CIVIL DEFENSE

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES...Up to 275 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS...Up to 800 H.P.

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

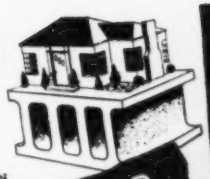
THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT AND QUARRY

Crandall's Concrete Products, Inc.

Manufacturers of Concrete Blocks

LIGHTWEIGHT — CELOCRETE — CINDER — CHIMNEY BLOCKS
BRICK — SEPTIC TANKS — GREASE TRAPS



Box 119 *Telephone* 5-4671
BENTON HARBOR, MICHIGAN

June 5, 1951

ONE GOCORP SENIOR LEADS TO ANOTHER!

...Gene Olsen Co...ration
101 Grace Street
Adrian, Michigan

Gentlemen:

We are taking ... with the Co... Pla... ...achine which was ...talled at this ... our complete satisfaction

In fact we are so well satisfied that we are already making plans for the early installation of another GoCorp "Senior". We shall advise your firm at the appropriate time.

...interested as to the reasons why ... GoCorp ... Equipment. Among "Senior" after ... the reasons are the following:

(1) Preference for "hydraulic operation" rather than "cam operation" to achieve lower maintenance costs.

(2) Preference for a "compact" unit with a minimum waste of space in the block machine room for plant-wide efficiency in materials handling.

(3) Lower labor costs through "one-man" operation of the GoCorp "Senior" at an output well above the rated capacity.

(4) Preference of the masons in this area for GoCorp "smooth" blocks because of uniform density and trueness to be found in block after block.

(5) We have enjoyed our business relations with you and the splendid service you have given us.

GOCORP SENIOR

12 or more eight inch blocks per minute . . . completely automatic . . . plain pallet . . . pallet return.

The "Welcome Mat" is out for any prospects for the GoCorp line of block machines at our Kings Landing Plant. Your prospects will be shown every courtesy by Eddie Miller or myself.

Very truly yours

CRANDALL'S CONCRETE PRODUCTS, Inc.

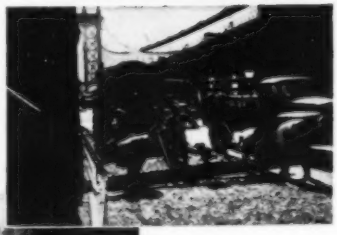
Forrest S. Pearson, Secy-Treas.

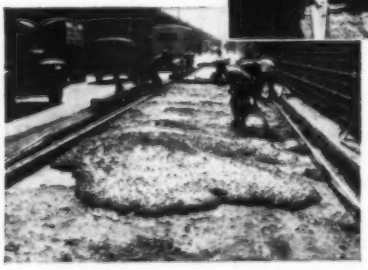
HERE'S WHY THEY ASK FOR 'INCOR'

Manhattan Miracle

Hard-Driving Program Helps Cope with World's Toughest Traffic Problems – Manhattan Bridge Repaving an Example

'Incor' paving on Manhattan Bridge; right, placing concrete while maintaining two-way traffic; below, 'Incor' Air-Entrained Concrete assures long-time, maintenance-free service.





● New York City has just about the toughest traffic problem in the world. But it would be lots tougher were it not for a well-planned maintenance program which keeps everlastingly at the job of making the most of every inch of the existing facilities. Sound selection of methods and materials produces near-miracles in keeping traffic rolling while repairs and improvements are being made.

Sections of Manhattan Bridge's main roadway, carrying the bulk of nearly thirty million vehicles a year which use this famous span, were repaved while maintaining heaviest two-way traffic. Every detail of the job was planned and timed in advance.

Taking full advantage of the dependable *high early* strength of 'INCOR' AIR-ENTRAINING HIGH EARLY STRENGTH PORTLAND CEMENT assured quickest re-use of the new paving. Dependable *high ultimate* strength, in turn, assures long-time, low-maintenance service—shown by many years' 'Incor'* performance on highways in New York City and throughout the nation.

*Reg. U.S. Pat. Off.

MANHATTAN BRIDGE — Manhattan-Brooklyn
Main Deck Repaving
Supervision: **DEPT. OF PUBLIC WORKS**, City of New York
General Contractor:
EDENWALD CONTRACTING CO., Bronx, N. Y.
Ready-Mix 'Incor' Air-Entrained Concrete:
COLONIAL SAND & STONE CO., INC., New York City

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N.Y. • BETHLEHEM, PA. • BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS
KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • RICHMOND • ST. LOUIS • WASHINGTON, D.C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 17 MODERN MILLS, 125,000,000 SACKS ANNUAL CAPACITY

NEWS OF CONCRETE MANUFACTURERS

Marietta Concrete Corp. Erecting $150,000 Plant For Slab Production

The Marietta Concrete Corporation, Marietta, O., has started construction of a new $150,000 plant in that city for the fabrication of insulated, precast concrete wall panels used in industrial curtain-wall construction, according to word from F. L. Christy, president of the firm. The plant is expected to be in operation within 30 days.

The panels were developed for use as non-load-bearing walls, and metal inserts cast into the slab enable the panel to be bolted directly to the steel framework of a building. Mr. Christy added that the use of these insulated, precast concrete wall slabs save as much as 40 percent of construction costs when used in place of ordinary masonry walls with the required insulation. He announced that the panels can be made with concrete using ordinary aggregate, or with "Beslite," a lightweight aggregate produced by The Marietta Concrete Corporation at its own Beslite plant.

These panels at the new plant will be reproduced by a continuous-production-line method. The firm reports that it already has orders for 500,000 sq. ft. of these insulated precast wall slabs which are being produced in its present Marietta plants.

The panels are 5 in. thick and are of laminated or "sandwich" construction. They are cast in steel forms by using an interior and exterior facing of concrete 1¾ in. thick, separated by 1½ in. of rigid insulation which forms the core. They are cast on muslin to provide a decorative, textured interior surface. The standard size of each slab is 8 ft. by 10 ft. Other sizes are available on order, Mr. Christy stated. These slabs have recently been used in the construction of a new power station and are being produced for other industrial buildings in the Marietta area.

• The $150,000 precast slab plant of the Marietta Concrete Corporation at an early stage of construction.

Coming Events

October 8-12, 1951 — Chicago. 39th National Safety Congress and Exposition. Stevens, Palmer House, Congress, Morrison, and LaSalle Hotels.

November 26-27, 1951—Chicago. Convention of National Association of Silo Manufacturers. Palmer House.

February 11, 1952 (week of)—Chicago. 22nd annual convention and exhibit, National Ready Mixed Concrete Association. Stevens Hotel.

N.C.M.A. Southern Meeting At New Orleans, Nov. 4-7

The Southern Regional Meeting of the National Concrete Masonry Association will be held in New Orleans, La., on November 4, 5, 6, and 7. Headquarters will be at the Roosevelt Hotel. Other downtown hotels will also make rooms available.

It is reported that a fine program has been arranged, and members and guests who expect to attend the meeting are urged to make their reservations promptly and directly with the Roosevelt or with other hotels.

Bowden Concrete Products Erects Advertisement— A New Office Building

Capitalizing on their own products in a most effective way, officials of Bowden Concrete Products in Memphis, Tenn., have created a striking exhibit of concrete masonry units in their newly-built office building. Nearly every size and type of unit manufactured by the company—about 40 sizes and variations—went into the structure, which also has a radiant heat installation in its concrete floors. Side walls and ceilings are of concrete masonry.

Bowden Concrete Products, established in 1946, features crack-resistant concrete block and brick. Last year a Besser Super Vibrapac plain-pallet stripper and equipment valued at more than $100,000 were installed. At the time this electronically controlled machine was installed, there were only three such units in the United States. The Vibrapac, a 15-ton unit, can produce an average of 600 to 700 concrete blocks per hour and has a capacity output of 1,200 per hour. It turns out three to six 8- by 8- by 16-in. units at a time. Tests have proved that the electronically controlled device refuses to mold a block if there is the difference of a blotter's thickness involved.

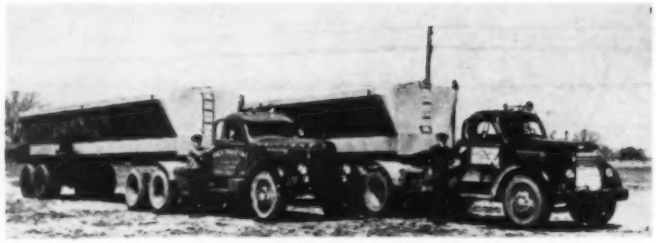
Other last-word items installed by the firm include a new overhead bin and conveyor with finger-tip control. The bin and conveyor equipment can handle 400 tons (approximately six carloads).

In addition to the concrete block and brick, Bowden also manufactures concrete roof slab and Besser Soffit floor tile in three thicknesses for light, medium, and heavy-duty floors and ceilings. Whereas the facilities in 1946 permitted the production of enough units in one day to build a home of average size, the plant now has the capacity to turn out enough in one hour to build a home of the same size.

Harry A. Barney, Binghamton, N. Y., vice-president and general manager of Barney and Dickenson, Vestal, N. Y., is the first president of the Empire State Sand, Gravel and Ready-Mix Association.

This association was recently organized to replace the defunct Empire State Sand and Gravel Producers Association. Other officers are: Leon Wendell, Lockport, N. Y., vice-president; W. W. Nass, Syracuse, secretary; and John Hopkins, Albany, treasurer.

Oscar H. Schmidt, a pioneer in the concrete block field at St. Joseph, Mo., died in that city on July 25. Mr. Schmidt owned and operated the Schmidt Concrete Products Company and the Oscar H. Schmidt Contracting Company. He was 66 years old.



● The Arrington Construction Company and the Ready-To-Pour Concrete Company of Idaho Falls, and the Atomic Energy Commission's Arco (Idaho) Proving Grounds are presently receiving bulk cement in two screw-type self-unloading carriers said to be the longest ever built. They were made by the Baughman Manufacturing Company, Jerseyville, Ill., for Pack Truck Lines, Idaho Falls. Each of the units, constructed of high-tensile strength alloy steel, is 35 ft. long and has a capacity of 175 bbl.

Annual Short Course Dates Announced—November 12-16

According to word from National Ready Mixed Concrete Association headquarters, the sixth annual Short Course for technicians of the ready-mixed concrete and sand-and-gravel industries has been tentatively scheduled to be held at the University of Maryland November 12 through November 16.

It is suggested that member companies determine who shall represent them, in order that reservations may not be delayed. Detailed information on the course will be issued at a later date.

Frank E. Milewski Victim Of Tragic Boating Mishap

The many friends of Frank E. Milewski will be shocked to learn of his tragic death on Sunday, August 12. Mr. Milewski was president of the Lith-I-Bar Company, Holland, Mich. While boating with Mrs. Milewski on Lake Michigan, he was thrown from the craft when it overturned and was drowned before help arrived. Mrs. Milewski was rescued.

Frank E. Milewski

Frank Milewski's close contact with the concrete building units industries dates back many years. He was for many years with the W. E. Dunn Manufacturing Company of Holland. He was sales manager when he left Dunn some years ago to concentrate on the sale of Lith-I-Bar concrete joist machines. Later he obtained the manufacturing rights to a vibrating block machine and sold it under the name of Lith-I-Block. Sales grew rapidly and at the time of his death his company was one of the leading manufacturers of block machines.

Dates for the 32nd annual convention of the Wisconsin Concrete Products Association, with headquarters in Milwaukee, have been announced by A. W. Devos, secretary. The meeting will be held at the Plankinton Hotel in Milwaukee on January 16 and 17, 1952. The annual banquet has been scheduled for the evening of January 16.

W. H. Acheson Chief of Ready-Mix Committee Appointed by OPS

The Office of Price Stabilization has announced the appointment of an Advisory Committee on Ready Mixed Concrete which will be headed by Walter H. Acheson, chairman. Mr. Acheson is now chief of the Building Materials Branch of OPS. He was formerly head of the Masonry Materials Division. In his new post he will be responsible for many important industries, including sand and gravel, crushed stone, slag, construction, cement, lime, gypsum, flat glass and glass containers, structural clay products, and related fields.

The new Advisory Committee was appointed by OPS Deputy Administrator Gilbert. It is required by law to represent geographical areas, small, medium, and large companies. At least one member of the group must be a non-member of the national association of his industry. Those serving on this committee must pay their own traveling expenses and maintenance.

Ceiling Price Filing Date Extended Indefinitely by OPS

According to a recent report, the Office of Price Stabilization states that Form No. 8 for filing new ceiling prices has been indefinitely suspended.

Producers are instructed as follows: if they filed Form No. 8 on June 14 or before, they are to continue to operate under the new prices; if they filed Form No. 8 after that date, they are to continue to operate under the General Ceiling Price Regulations.

It was stated that Form No. 8 had been suspended "so that provisions of the new Capehart Amendment may be taken into consideration in filing new ceiling prices." Local newspapers will report later developments.

Masonry Assn. Studies Cost Of Unit Heaters for Drying Block

The National Concrete Masonry Association has just released to member companies a report on the utilization of portable heaters for accelerated drying of concrete masonry units in stockpiles. The information will be of particular interest to block producers whose present facilities include no specific provision for meeting moisture content limitations.

The drying method on which the report is based requires stockpiling the units so that the cells provide reasonably continuous passageways for the flow of air. The stockpile is covered with canvas tarpaulins, and dry warm air from a portable heater is directed through an inlet in the canvas at one end of the pile. The opposite end of the pile is vented to provide circulation and to permit water vapor to leave the enclosure. The principal details of such a set up, along with suggested arrangements of the units in the stockpile, are illustrated in the report.

The N.C.M.A. studies indicate that under average conditions the cost of accelerated drying will approximate 1.2 cents per 8- by 8- by 16-in unit, and 1.0 cent per 4- by 8- by 16-in. unit. These estimates are based on the removal of 1.0 lb. of water per unit in the case of the 8-in. block, and 0.6 lb. per unit in the case of the 4-in. block. Included in the figures are the initial investment in equipment for drying 1,000 units per day, and such direct operating costs as fuel, power, and extra labor.

The association's report includes estimates of drying time for stockpiles of various sizes and for heaters of various capacities. A number of worthwhile suggestions are made regarding the general method of operation. The full report is available to N.C.M.A. members only.

Ohio R.M.C. Association Convenes in Cincinnati For Annual Session

The Sheraton-Gibson Hotel in Cincinnati, O., was the scene of the Ohio Ready Mixed Concrete Association's annual meeting on June 19 and 20. Those arriving on the 19th had an opportunity to attend the National Leage baseball game — Cincinnati vs. Brooklyn — that evening.

On the morning of the 20th C. A. Persons, president of the association, opened the session and called for committee and routine reports. The featured speakers of this session were Ralph H. Anderson of W. E. Anderson Sons Company, Columbus, O., who gave an address entitled *A Successful Safety Program*, and Walter H. Acheson, Masonry Materials Section, Building Materials Branch, Office of Price Stabilization. Mr. Anderson's safety program has gained national recognition as a practical approach to improved public relations for the industry.

Mr. Acheson, who was formerly on the staff of a ready mixed concrete and building material business in Champaign, Ill., and a past president of the Wabash Valley Ready Mixed Concrete Association, covered orders and interpretations of OPS.

At the luncheon that noon the speaker was Vincent P. Ahearn, N.R.M.C.A. executive secretary. The address was followed by a discussion period. The annual business meeting concluded the conference.

Herbert Rusk, Mansfield, was elected president, and Claud L. Clark, Columbus, was re-elected secretary-treasurer.

Book on Grading Aggregates Authored by L. B. Mercer

A new publication entitled *The Law of Grading for Concrete Aggregates* has been published by L. Boyd Mercer, M.C.E., Melbourne, Australia. The 113-page text embraces two papers presented by the author, the first at a conference of the Institution of Engineers in Brisbane, Australia, and the second at the Australian and New Zealand Association for Advancement of Science Congress, also in Brisbane.

According to Mr. Mercer, "The real theme is to remove all mystery from the influence of aggregate grading upon concrete control and by so doing to conserve material supplies and save wastage in labor and materials." A limited number of books will be available.

WE'RE MOVING!

On September 20, Concrete Manufacturer headquarters will be moved to The Manhattan Building, 431 South Dearborn Street, Chicago 5. The new offices will provide better and more spacious facilities for our steadily expanding activities in serving the vast nonmetallic minerals industries, and it is hoped that many of our readers will avail themselves of our cordial invitation to drop in for a visit.

A-1 Truck Maintenance Plan Pays Off in Safe Driving

Awards for accident-free, damage-free driving were presented to more than two-thirds of the drivers of their fleet of 61 ready-mixed trucks last year under the safety plan of the Stewart Sand and Material Company, Kansas City, Mo., according to an article in the May, 1951, issue of International Trail, International Harvester Co. magazine. This plan is administered by a driver-controlled safety council and keeps safe driving a live topic, with monthly meetings and an annual awards dinner. Monthly and yearly cash awards are made for accident-free, damage-free driving which may total as much as $50 for a perfect year.

Virgil Skaggs, boss of transportation, claims that indoctrinating drivers properly is one of the major requirements for a successful safety record. "Generally, a good driver means a good truck, and a poor driver means a truck will give you trouble, he points out. "So we do everything we can to impress on each driver that it's important to him as well as the company to drive right, to check his truck systematically, and keep it in good shape."

Another big item in the safety program is the constant attention given to regular servicing and maintenance of most of the trucks by the International Motor Truck Branch in Kansas City, Mo., and daily washing, constant dusting (several times daily if needed), and yearly painting. Most of the repair work is scheduled for nights.

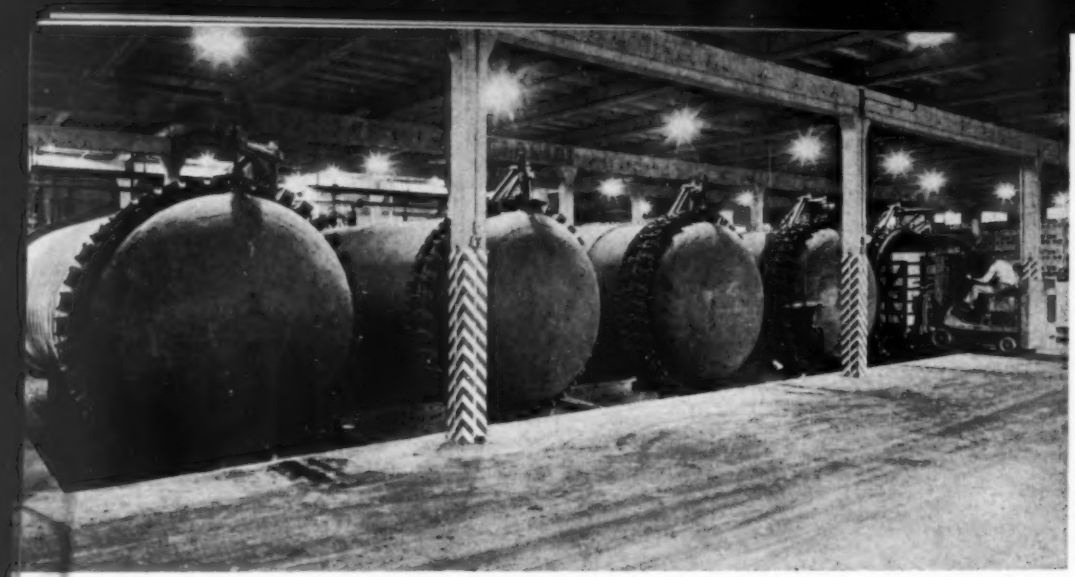
"Steering and brakes—we watch those every minute," Mr. Skaggs reveals. "Sometimes on a big pouring job we'll have to punish a truck, keeping it going when ordinarily we'd have it up for repairs. But we stop a truck right away if there's a question about its steering or brakes."

The Stewart Sand and Material Company operates ready-mixed concrete plants in Kansas City and Independence, Mo. As the Ready Mixed Concrete Company, it operates plants in Kansas City, Turner, and Merriam, Kan. Other operations of the firm include four material yards and an asphalt plant in Kansas City, Mo., a limestone mine and plant at Pixley, Mo. (producing crushed stone and agstone), and sand dredges on the Kansas and Missouri rivers.

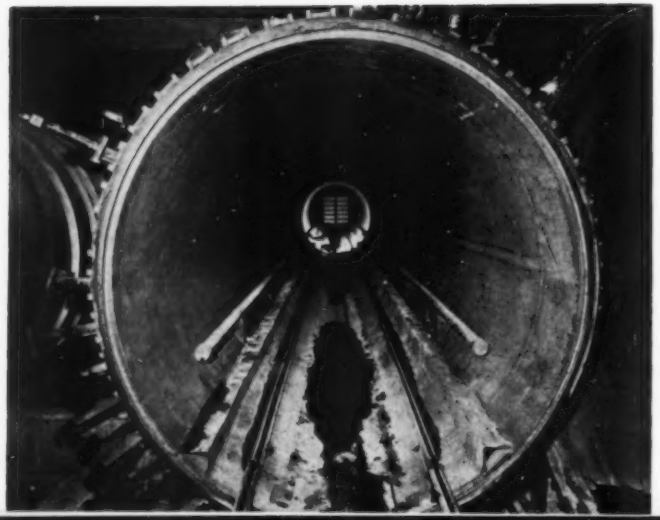
The ready-mix delivery fleet consists of 52 International trucks and 9 of other makes.

• Officials of the Stewart Sand & Material Company say they have the "best-looking fleet of trucks in the business." Every truck is washed daily, wiped for dust once or twice a day, and painted yearly. Shown here is a new International LF-172 (GVW 26,000 lbs.) getting a "once over lightly" from Don Burch.

• Stewart fleet boss Virgil Skaggs (center), inspecting a new LF-190 with George H. Cook, general superintendent of plants, and A. F. Van Gordon, mechanic. In 1950 more than two-thirds of the truck fleet crewmen won cash awards for accident-free, damage-free driving under a company-wide, driver-controlled safety council plan.



Harter Marblecrete Installs High Pressure Curing System



TOP, LEFT: View inside the new building shows four of the autoclaves loaded and sealed, and the fifth unit at the far right in the process of being loaded.

TOP, RIGHT: General view of Harter Marblecrete Stone Company's modern block plant at Oklahoma City, Okla. Low building in the foreground houses the new high pressure steam autoclaves.

AT LEFT: View through the open door of one of the autoclaves shows the arrangement of rails and steam headers and the angle-iron ledges which support the block racks.

AT RIGHT: Noel D. Harter, vice-president and secretary of Harter Marblecrete, and B. D. Harter, president of the company.

$250,000 Installation at Oklahoma City Involves Largest Autoclave Ever Built Plus Use Of Vacuum Process For Drying

BY WILLIAM M. AVERY

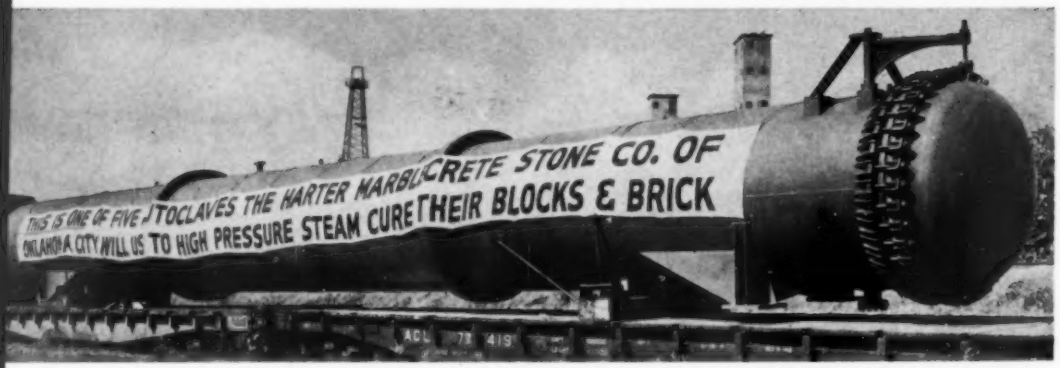
another ON THE SPOT report

ONE of the outstanding recent developments in the much-discussed field of curing is the installation of high-pressure steam autoclaves at the plant of Harter Marblecrete Stone Company in Oklahoma City, Okla. The move is of considerable importance to the block industry because of the calibre of the subject firm, because the autoclaves themselves are the largest ever built for curing concrete masonry units, and because a new dimension (vacuum drying) has been added to the science of curing block.

Each of the five autoclaves in this well-engineered installation has an inside diameter of 8 ft. and a length of 95 ft. 6 in. They are the first 8-ft. diameter cylinders ever built for curing block, although a unit of the same size has recently gone into operation at another block plant. The unusually large diameter was decided upon in order to utilize existing L.T. 50, 5,000-lb. Towmotor lift trucks, and standard 72-block racks set at right angles to the centerlines.

The autoclaves are of all-welded construction, with ¼-in. steel boiler plate forming the shell. They are insulated throughout their length by a 2-in. layer of fiber glass covered by aluminum velum. To reinforce the shells against the external pressure which builds up in the vacuum stage of the process each cylinder is fully encircled at the third points with two 6-in. deep inverted "T" beams.

The units, each of which weighs


THIS IS ONE OF FIVE AUTOCLAVES THE HARTER MARBLCRETE STONE CO. OF
OKLAHOMA CITY WILL US TO HIGH PRESSURE STEAM CURE THEIR BLOCKS & BRICK
ACL 72 419

Each of the five autoclaves was shipped, fully fabricated, on two railroad flat cars. The units weigh 54 tons each.

about 54 tons, were fabricated at Tulsa by the McNamara Boiler Co., and shipped to Oklahoma City by rail, two flat cars being used for each. The hemispherical doors swing away from the autoclaves for loading and unloading by means of davits which support the doors from the tops of the autoclaves. Each door is held shut during the curing cycle by 38 2-in. diameter high-tensile steel bolts which are set with a size 577 Ingersoll-Rand impact air wrench. The sealing operation takes about 15 minutes per door.

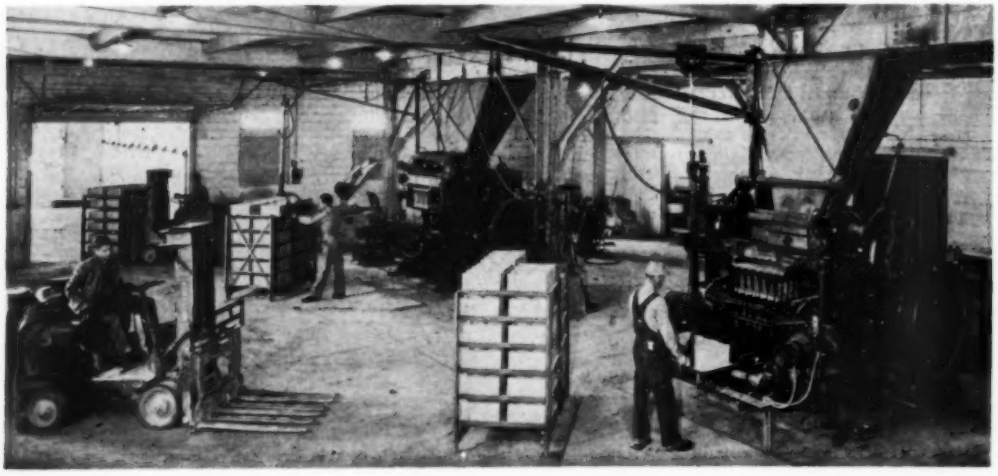
Steam is admitted through 3-in. diameter pipes which extend the full length of each cylinder, and on both sides, at a height of about 1 ft. above the rails on which the lift trucks operate. To assure uniform distribution of steam, the pipes have ⅜-in. diameter drilled holes on 8-in. centers throughout their lengths. The steam is generated by a 300-hp. gas-fired fully-automatic Kewanee high-pressure boiler operating on forced draft. For the drying stage of the process a 26-in. vacuum is pulled by means of an Elliott barometric condenser. Water consumption for the entire curing operation varies from 15,000 to 20,000 gal. per day.

The system was designed to operate with saturated steam at pressures ranging from 140 to 150 p.s.i. and temperatures ranging from 360 to 365 deg. F. to obtain the desired atmosphere of saturated water vapor in the autoclaves. Each cylinder when fully loaded holds about 2,000 8- by 8- by 16-in. equivalents. Since a full cycle of curing and drying can be completed in about 12 hours, the capacity of the entire system is 20,000 units per day, which coincides with the double-shift output of the two Besser Super Vibrapac block machines.

The green block are loaded into the cylinders as rapidly as the racks are filled, the two block machines requiring a little over an hour to fill each cylinder. By the time the door is closed and sealed and the steam is turned on, all of the units are at least an hour old. The steam pressure inside the cylinder is increased at a uniform rate until it reaches approximately 145 p.s.i. This level is attained in a period of about an hour and 45 minutes after steam is first admitted. The maximum pressure, which is accompanied by a maximum temperature of about 365 deg. F., is held by means of automatic controls for a period of 7 hours. Each autoclave has a separate pressure-recording device, and is equipped with individual automatic controls, to assure the greatest possible uniformity from batch to batch.

At the conclusion of the 7-hour

In the plant proper blocks are molded on two high-production vibrating machines. Racks hold 72 standard units.



New facilities include a roomy, well-equipped laboratory for production control and research. On the far left is the compression machine used for testing several blocks from each of the curing cylinders.

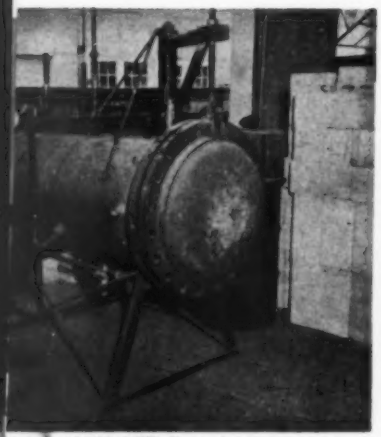
holding period the steam is exhausted to other autoclaves or to the atmosphere, depending upon the cycle of operation. The blow-down is accomplished as rapidly as possible (about 15 minutes) to help in reducing the moisture in the block. Then the barometric condenser is used to pull about a 26-in. vacuum, a stage of the operation which takes about 15 minutes. The vacuum is maintained for about an hour, whereupon air is admitted to the cylinder, the door is opened, and the racks are removed and taken to the cubing area. The time required for unloading is approximately 45 minutes per cylinder.

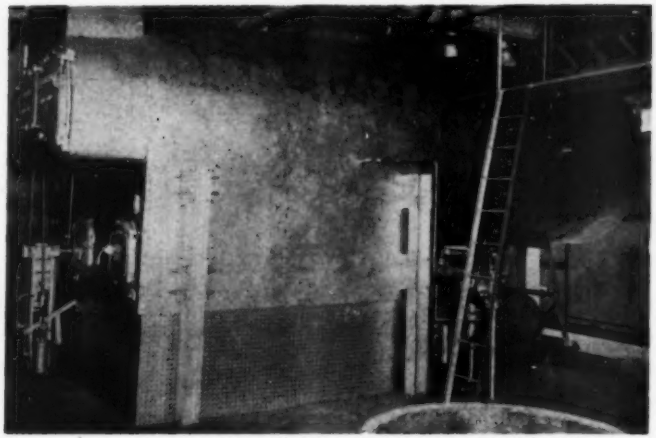
Although the vacuum stage of the process is an entirely new development, and some aspects of it must be regarded as experimental, the company feels that it is an important factor in the outstanding success of the installation. Their experience with high-pressure curing alone indicated that the block would meet moisture requirements after about a day and a half of covered storage; with the vacuum process the units are well below specification requirements when they are removed from the autoclaves, and there is no need for intermediate covered storage before shipping. Thus it is felt that vacuum drying is a logical step toward the full utilization of the advantages which are inherent in high-pressure-steam curing.

The Harter organization adopted high-pressure curing only after prolonged and detailed study of curing systems in general, and of their effect on the performance of concrete masonry units. Investigation led to the conclusion that to attempt to meet rigid specifications by aging the units required the development of huge covered storage areas, and the exercise of far more foresight in the determination of the types and sizes of block to be produced, than any organization was likely to acquire.

Company officials long ago adopted the attitude that the business was actually selling walls and structures, rather than just concrete masonry units. Out of this attitude there grew a fixed belief that the firm's products must render maximum service to the buyer, and that a solution must be found, regardless of cost, to correct such causes of poor performance as shrinkage cracking. Once the company was satisfied that high-pressure curing would provide the best solution known, the problem became a matter of how and when to undertake an installation.

BELOW, LEFT: The 38 2-in. diameter, high-tensile steel bolts of each autoclave door are closed speedily with an impact wrench. When steam pressure inside the unit reaches 145 p.s.i., load on door totals approximately 524 tons. BELOW, RIGHT: Close-up of a loaded lift truck entering one of the autoclaves. Note the small flanged wheels beside the tires which engage the rails running the length of each cylinder.





ABOVE, LEFT: Research on various cycles of high-pressure-steam curing is carried on with this pilot model autoclave. ABOVE, RIGHT: Steam is generated with this 300-hp. gas-filled, fully-automatic boiler.

The complete installation, including the building which houses it, was carried out at a total cost of approximately $250,000. The all-concrete structure measures 128 ft. by 170 ft., and provides generous space for the autoclaves (set on 12-ft. centers), and for a boiler room and laboratory, as well as areas for covered storage and cubing. All installation and construction work was carried out by company employees, a factor which undoubtedly helped to hold down the total cost of the job.

The company's new laboratory, which is adjacent to the boiler room, has complete facilities for both production control and research on concrete products. The work is under the supervision of a full-time chemical engineer. Production control activities include careful testing of all raw materials, close attention to grading and formulation, and strength tests and other checks on the quality of the units from each of the five autoclaves. Compressive strengths are determined on a 100-ton Yoder concrete testing machine. Research equipment in the laboratory includes a pilot model autoclave with which the company plans to make detailed studies of various cycles of high-pressure-steam curing.

Since it has been several years since any detailed discussion of high-pressure-steam curing has appeared in these pages, it seems in order to present here some information concerning the effect of the process on the quality and general performance of concrete masonry units. One of the outstanding characteristics of high-pressure-steam-cured units is that in drying from a saturated condition to an approximate balance with the moisture contained in the air of heated buildings, they shrink about 50 percent less than moist-cured or low-pressure-steam-cured units. This is at least in part a by-product result of the fact that such units attain in 12 hours a compressive strength at least equal to the strength of moist-cured units at 28 days.

This high-early-strength is permanent, and it is partly due to the acceleration of the hardening process. An important contributing factor, however, is the combination of lime (hydrolized from the cement) and silica (present in both the cement and the aggregates) to form hydrated calcium silicates. These crystalline compounds are not only stronger, but are far more stable than the amorphous calcium silicates which are formed at ordinary curing temperatures, and they undergo far less volume change as a result of changes in moisture. Other highly stable compounds known as hydrogarnets are formed as a result of high-temperature curing, and these are also believed to have an important bearing on the reduction of volume changes due to moisture.

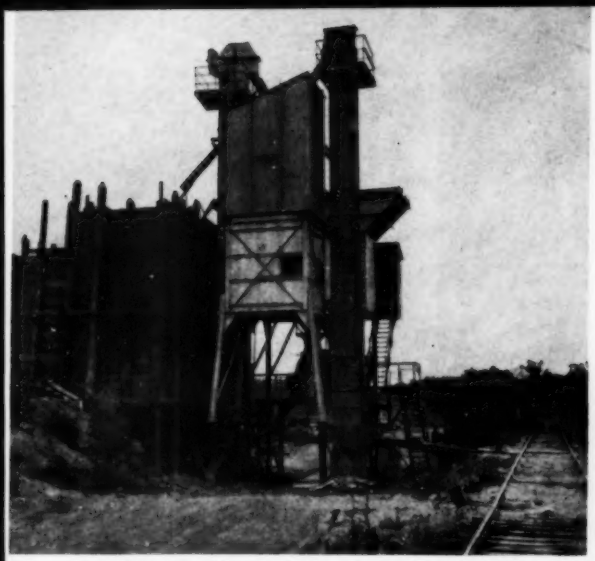
High-pressure-steam curing has a number of other important effects upon the quality of concrete masonry units. It greatly reduces efflorescence and leaching, and has a marked tendency to reduce spalling by stabilizing any unsound particles of material contained in the concrete. It produces block which are substantially dryer and lighter in color than moist-cured units and which show greater resistance to sulphate action.

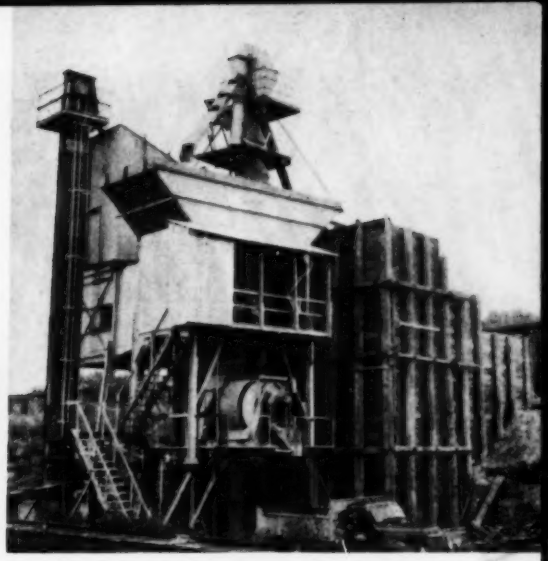
Perhaps the most important effect of the process from the standpoint of the producer is that it enables him to deliver, within 24 hours after molding, a product which can meet the most exacting specifications. This consideration has assumed great importance in recent years, as block producers have been called upon to supply an ever increasing variety of types and sizes of units, with the result that it has become virtually impossible to anticipate production requirements far enough in advance to allow for adequate periods of yard storage. The trend has also increased the amount of capital which must be tied up in inventory, and has made it necessary for most plants to develop larger storage areas.

As stated earlier, block produced in the Harter autoclaves with vacuum are under the 30 percent moisture limitation required by recent federal specifications at the time they are removed from the autoclaves. In practice this means that whenever it is necessary to do so, the company can make block one day and deliver the same units, ready to use, on the following day. For practical reasons it is still desirable to carry an inventory of special sizes and shapes in order to operate the block machines at maximum efficiency. All production is cubed. Specials and sizes that cannot be engaged with lift truck forks are cubed on wood pallets.

Compared with the conventional low-pressure curing system which the company formerly used, the new system entails some increase in labor. Based on the same output of block,

(*Continued on page* 182)





ABOVE, LEFT: View of the Otoe Concrete Products & Materials Company plant at Nebraska City, Neb., with cement screw, elevator, and bin in foreground. ABOVE, RIGHT: General view of plant with aggregate track above and cement siding in foreground.

Small-Town And Rural Market Support Modern Ready-Mix Plant

By WALTER E. TRAUFFER

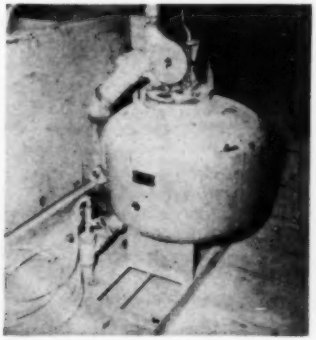
THAT a town of 8,000 people can support a modern ready-mixed concrete operation, if efforts are made to develop the farm market around it, was proved by the Otoe Concrete Products & Materials Company of Nebraska City, Nebraska. This independent corporation was formed primarily to provide the concrete for street and highway paving contracts in that area for the Dugdale Construction Co. of Omaha. These contracts left some plant capacity available for commercial demands and these have been developed sufficiently to justify continuation of the plant as a permanent operation to supply the area. Most of the concrete now produced goes to farms within a 40-mile radius for the construction of grain elevators, feeding floors, etc. Although there are 250,000 people in that area, which includes the southwest corner of Iowa, there are no other concrete facilities available. The balance of the output goes into streets, highways, homes, small business structures, etc.

This plant went into operation on May 15, 1950, and since then has operated a 6-day week except when the cold or rain has made it impossible to pour concrete. In its first four months of operation 8,750 cu. yd. of concrete were produced and the record day's output was 266 cu. yd.

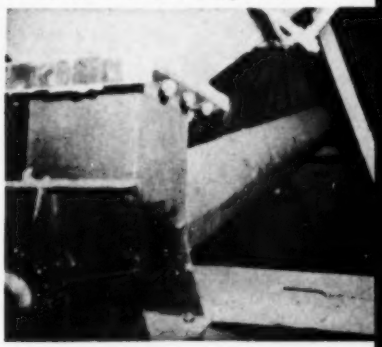
The plant is located on a siding of the C. B. & Q. Ry. on the southeast edge of town and near the end

Drum of admixture with dispenser below.

Water measuring tank on batching floor.



Cement screw from bin to weigh batcher.



Mixer discharging batch of concrete into special dump truck.

of the bridge which crosses the Missouri River into Iowa. Aggregates and bulk cement are received by rail, the sand and gravel coming from the Plattsmouth, Nebr. plant of the Lyman-Richey Sand & Gravel Corp. 25 miles to the north. The aggregates are received on a high-level siding and the cement on another siding at a lower level. The sand and gravel is discharged through a track hopper onto a tunnel belt conveyor (Triangle Engineering Co.). A 55 ft. Blaw-Knox bucket elevator discharges this material either into a 3-compartment, 100-ton plant bin or by means of a swinging chute into three wooden storage bins over this tunnel. These hold 12 cars of sand, 8 cars of crushed gravel and 12 cars of road gravel, respectively. For some jobs crushed stone is used. The same tunnel belt conveyor reclaims from these bins to the plant.

The cement is received in bulk hopper cars averaging 400 bbl. capacity. It is discharged into a hopper from which an inclined screw conveyor feeds a 55-ft. bucket elevator to the 400-bbl. plant cement bin. An upper-level Bindicator is used to show when the bin is full.

A one-compartment Blaw-Knox weighing batcher is used for both cement and aggregates. The cement is fed from the bin to the batcher through an 18-ft. inclined screw conveyor which is automatically shut off by a mercury switch and brake when the desired weight is reached on the scale beam. The accuracy of this system is within 3 lb. The aggregates are discharged into the batcher through lever-operated gates. There is a 3-beam aggregate scale but only 2 aggregates are being used in any of the current mixes.

The dry batch is discharged from the batcher through a chute direct to the mixer. This chute has a second leg and flop gate so that dry-batched concrete mix or dry-batched aggregates can, if desired, be loaded direct into dump trucks. Water is discharged into the 28S Koehring mixer from a Koehring volume measuring tank.

Protex admixture, made by the Autolene Lubricants Co., is used in all concrete produced although it is only required on state and federal construction. The company finds it advisable to use Protex for all work because it produces a more workable concrete and its resistance to freezing and thawing is an advantage of this climate where there are wide extremes of hot and cold weather. The use of this admixture has been found to hold the initial set very well, keeping concrete workable as much as 1¼ hr. after mixing. About 4 oz. of liquid Protex is used in a cubic yard with the usual 1:4 mix; the amount is varied for other mixes. A clock on the dispenser is set for the required number of seconds for the amount needed.

The concrete is delivered by a fleet of Ford F6 trucks with Maxon 2-cu. yd. Dumpcrete bodies. Occasionally dump trucks are also used for very short hauls. Because of the speed with which the plant went into operation there are many refinements now under way. The yard is being enlarged and paved so that trucks can turn around and then run under the plant instead of backing in. It is also planned to build a new office building and a concrete block plant.

The officers of the company are: V. C. Olsen, president and operating manager; Dr. W. S. Ramacciotti, vice-president. F. W. Currey is plant manager. Mr. Olsen has had a long experience in the ready-mix industry, having started with the original Ready Mixed Concrete Co. of Omaha in 1928. When this company was sold a few years later, he joined another producer, staying on this job until 1946.

Harter Marblecrete

(*From page* 180)

the plant now employs two additional men per shift.

The Harter firm, under the name of Harter Marblecrete Building Co., was formed in 1919 to produce a patented cored-slab building unit. The present name was adopted in 1922, when the company was reorganized, and major emphasis was given to the production of ornamental building stone trim. About 50 men are now employed in making building trim. The company started producing concrete masonry units on a volume basis in February, 1946, when the present plant was placed in operation. The design of the plant was based on the operation of two Besser Super Vibrapacs, and the second machine was installed a year later.

The aggregate storage system consists of a 6-compartment overhead Butler bin which has a total capacity of 560 cu. yd. Additional storage of 879 cu. yds. is provided by concrete block bins which are connected by conveyor belts to the elevator that feeds the overhead bins. Heavyweight units are made with crushed limestone and sand. Lightweight units, which account for at least 50 percent of total production, are made of expanded shale. The plant is equipped to rescreen and reblend portions of the lightweight materials in order to assure maximum control of grading.

Officers of the company are B. D. Harter, president, and his brother, Noel D. Harter, who is vice-president and secretary, and who is also in charge of production. In addition to the facilities already mentioned, the company also operates a roof slab plant and a tile glazing unit on the same property.

Constructing Concrete Masonry Walls In Remodeling General Offices of P. C. A.

A NUMBER of architects, home builders, engineers and others have seen the exposed concrete masonry walls in the newly remodeled Portland Cement Association General Office Building at Chicago, and in its new Research and Development Laboratories, Skokie, Illinois. Almost without exception they have been impressed with the variety of architectural treatments used, the excellent acoustical results obtained, and beauty of the finished walls. As a result, the association has received scores of requests for detailed information on how the walls were built.

This article, prepared by the association, outlines the principal steps followed in designing, constructing, and painting exposed concrete masonry interior walls.

General Painted concrete masonry walls were selected because of the interesting surface texture, the variety of masonry patterns available, the acoustical properties of the open texture block, and the pleasing colors of the painted walls.

Concrete block used are the commercial grade of all types of lightweight and heavyweight block manufactured in the greater Chicago area. The architect's specifications called for block with "medium rough texture" with the intent that such surface would retain the interesting texture characteristics and acoustical values after it was covered with portland cement paint.

Uniformity Of Sizes All block were specified to be "in sizes required, according to drawings, which follow dimensions as established by the American Standards Association for 'Clay and Concrete Modular Masonry Units' . . . All units shall be fabricated to meet the required dimensions within $\frac{1}{16}$-in. plus or minus."

Many of the walls were exposed and painted on both faces; hence it was essential that all block be uniform in size to produce true plane surfaces in the finished walls and to facilitate the construction of straight joints.

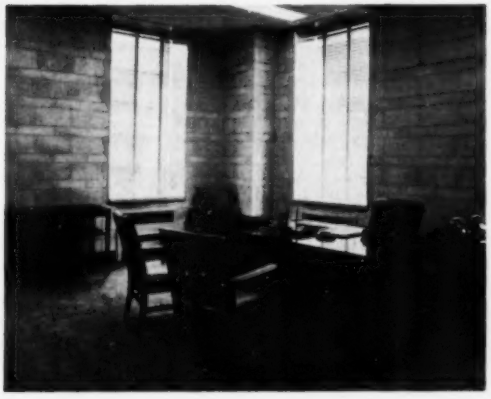
Other Requirements The block were further required to conform "to the physical requirements of the Standard Specification, ASTM Designation C90-44 when delivered on the premises. No broken, cracked, or warped units were permitted in the work."

Experience in the construction of the association's Research and Development Laboratories showed that the majority of the block delivered to the job did not comply with the moisture limitations of the ASTM specifications. Consequently, the specifications for the General Office building required that "in addition to the curing treatment at the plant, all concrete masonry units be subjected to the following drying operation on the premises. Upon delivery, all units shall be stored and seasoned inside the building for at least one week before using, as follows: Units shall be stacked in piles

• Left: In this picture of the stockpile of block the dark spots indicate moisture before drying. Light-colored block have been dried and are ready to be laid in the wall.

• Below, left: Perspective of one of the corridors, illustrating the effectiveness of horizontal stacking.

• Below, right: One of the offices, showing the interesting treatment when two sizes in running bond are employed.



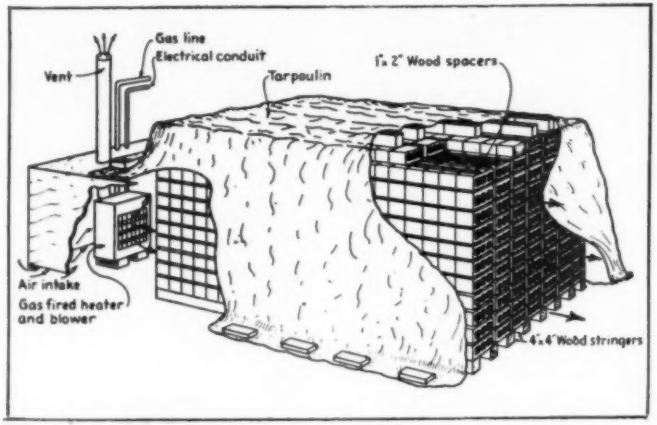
not over eight units high, using 1- by 2-in. wood strips between courses with units spaced 1 in. apart laterally. Piles shall not be over 6 ft. wide nor more than 16 ft. long." (These dimensions are more or less arbitrary and were influenced by the type of drying facilities available.) On this job the drying equipment was furnished to the contractor by the owner.

In the later stages of construction it was found necessary, because of space limitations, to store and dry block out of doors. Protection against the weather was obtained by a waterproof tarpaulin cover over a light framework. Drying both indoors and outside was accomplished by means of a gas burning heater and blower. Hollow units were stacked on their sides to permit air to be blown through the cores. The bottom rows of units were placed on 4- by 4-in. stringers to permit free flow of air under the piles. (See illustration).

The method of drying proved so effective that the block would usually be dried to 20 percent or less of their maximum absorption in a 48-hour period. This degree of dryness was desirable to reduce, to a practical minimum, the danger of shrinkage in the finished walls, which would be subjected to moderately high temperature and low relative humidity.

Sample Panels Probably the most important factor in securing the excellent workmanship and appearance of the finished walls was the construction of sample panels in advance of letting the contract. On all important jobs this procedure is strongly urged because it is practically impossible to describe, in words or even with photographs, exactly the finished appearance desired.

The sample panels were built and kept on the premises. These panels were 32 in. high by 40 in. long and demonstrated the exact masonry patterns, wall textures, types of mortar joints, and nature of painted surfaces required. Examination of these panels was a mandatory requirement of the specifications, and they were maintained for reference throughout the work. Products manufacturers, before submitting bids, were requested to inspect the panels and give assurance that they could supply block of the sizes, quality and texture of those in the samples. In the specifications contractors were asked to note that exposed concrete masonry was to be used in substantially all areas throughout the building; that the work was to be laid by skilled masons; and that particular attention was to be given to securing a job equal in workmanship to that in samples.



• Diagram of a stockpile, illustrating how block were stacked and artificially dried on the job by means of a gas-fired unit heater and blower.

Construction The specifications further required "all block masonry partitions, wall and column facings, and miscellaneous furring to be constructed absolutely straight, plumb, and in perfect alignment, and all exposed work shall be laid up in various face bond patterns, strictly in accordance with detailed drawings covering various areas . . . Joints shall not be in excess of ⅜-in., with all bed and vertical joints full and shoved tight; all exposed joints shall be compacted and tooled after the mortar becomes quite stiff . . . all excess mortar shall be completely removed and edges wiped clean as the work proceeds."

The mason contractor preferred a tooled "V" joint and was permitted to use it in much of the masonry work where depressed joints were specified. All cutting of block was done with a rotary power saw, producing straight sharp cuts with true edges and corners. All block were required to be cut in a dry condition to avoid getting the block wet before they were placed in the wall.

All block were "laid up in mortar composed of one (1) part masonry cement, Federal Specification SS-C-18-lb., Type II, and three and one-half (3½) parts of (damp, loose) sand. Sand shall be clean and sharp, free from dirt and foreign material of any kind". Local mortar sand was found to be deficient in *fine* fines. This deficiency was corrected by blending with fine sand.

Painting Most of the masonry walls were given one coat of portland cement base paint. Specifications covering application followed closely recommendations as given in Portland Cement Association Circular P-160C, and the directions furnished by the cement paint manufacturers. The following abstracts from the architect's specifications relate to painting. "Concrete block surfaces must be clean, free of dirt, dust or any substances which would prevent paint from bonding to the surface. The paint must be applied over a slightly damp surface; if surfaces are dry, same shall be dampened. The cement paint shall then be applied in one substantial coat and scrubbed into the joints and surfaces of block, using a stiff fiber bristle scrub brush."

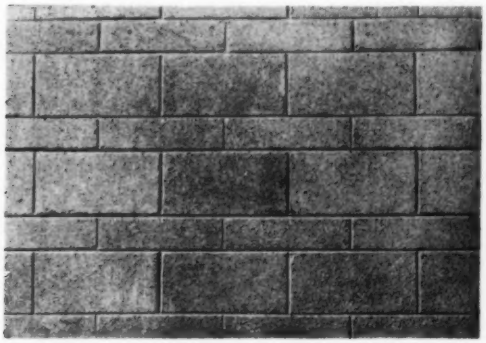
With few exceptions the painters were able to produce a thoroughly satisfactory job with one coat of portland cement base paint. In the few instances where coverage was not uniform, the difficulty could be largely attributed to applying too much water spray in dampening the walls before painting or to failure to stir the paint frequently enough to keep the solids in suspension. Where a one-coat job did not give satisfactory coverage, a second coat was applied. Painted surfaces were cured by keeping them slightly damp for 24 hours by spraying with water; such spraying was commenced as soon as the paint had set sufficiently to withstand this treatment without damage. The spray equipment used for dampening walls and for curing the paint was the ordinary hand-pressure garden spray—three-gallon capacity—fitted with a fine fog nozzle. Too much emphasis cannot be placed on the exact procedure for dampening walls slightly in advance of painting

and in curing the paint after application. If too much water is applied to the walls either in advance of painting or for curing, it may lead to shrinkage cracking of the walls after they dry out. Too little water, particularly for curing, will usually cause the paint to chalk or dust when it becomes dry.

The following paragraph from the architect's specifications relates to the quality of cement base paint required.

"Cement Base Paint for use on concrete block masonry and cement plaster surfaces shall meet the requirements of Federal Specification TT-P-21, Type II Class A."

Portland cement base paint was purchased from a number of manufacturers in different parts of the country. Twenty-three different colors were used. Considerable variation in appearance was found in the same brand and color of paint when applied to walls of block made with different kind of aggregates,

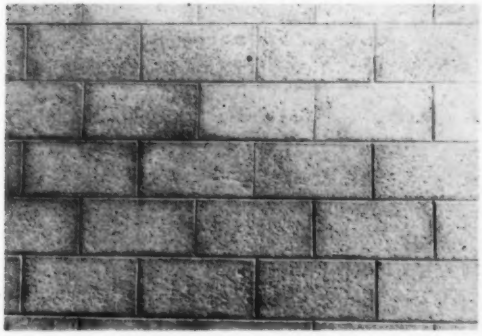


• Above, left: Two sizes in running bond.

• Right: Basket weave pattern.

• Left: Vertical stacking.

• Right: Patterned ashlar.



• Running bond.

• Horizontal stacking.

different surface textures, and when painted walls were exposed to natural daylight or to artificial light.

In order to study paint colors more closely, small areas of the different types of walls were painted with various brands and colors of paints under consideration. (These were in addition to the original sample panels.) These sample areas were referred to in selecting final paint colors and for reference by the painting contractor throughout the work. *The use of sample areas is strongly recommended in selecting paint colors where fine finishes are sought.* The same curing procedure should be used on these sample panels and areas as is specified for the job, to be certain that the paint selected will become hard, that it is free from dusting, and that it produces the color desired. A true portland cement paint, properly applied and cured, will produce a hard surface free from dusting.

Control Joints The following reference to joints in the specification is of interest. "In further reference to joints, the contractor's attention is called to a special requirement concerning vertical (control) joints, required at specific locations indicated on the drawings, unless otherwise directed . . . These shall be continuous from floor to top of wall in every case, and mortar in same raked out a full ¾-in. as work proceeds, and later pointed with an approved 'mortar color' elastic cement, finishing the same as regular mortar joints. In no case shall 'control' joints be farther apart than 30 ft. in walls continuing without a break in surface of same . . . Elastic cement shall be a compound approved by the architects-engineers."

Vertical control joints were placed at all intersecting concrete masonry walls, at all junctures of concrete masonry walls and columns, at all interior corners, and in straight walls more than 30 ft. in length. All walls in this project were non-bearing.

Supervision Even before the contract was let, the architect and owner made every effort to be certain that all prospective contractors and suppliers had complete knowledge and understanding of all details of the job requirements. Throughout the job there was the closest cooperation between the architect and the general, masonry, and painting contractors. There was close supervision of the masonry work and painting by the architect's superintendent, the general superintendent, and the owner. From the outset any defective block laid in the wall had to be removed as soon as discovered, and careless workmanship on mortar joints had to be remedied. Very few controversies developed because the sample panels were always available for reference as to the standards of workmanship, etc. required.

In general, the workmanship throughout the building is of excellent quality. All of the masons had had some experience in laying concrete block and realized the necessity of producing walls of the quality required in the specification. Of the dozen or more masons who worked on this job, only two were found to lack the required skill to turn out satisfactory work. The painters had not previously had experience in painting concrete masonry walls with portland cement base paints, but by paying close attention to the methods described in the specification, they soon acquired the necessary skill to produce completely satisfactory work.

Only a small percentage of the concrete block delivered on the job was rejected because of inferior quality. The principal reasons for rejection were non-modular sizes, broken corners, and cracked surfaces or irregular edges which would not permit building walls of the required quality. Slightly defective block were used in unexposed sections of walls and when fractional lengths had to be cut. For walls exposed on both sides, very close attention was given to the thickness dimension.

Combustion By-Products Co. Names Lovewell to New Post

C. E. Lovewell has been appointed by Combustion By-Products Company of Chicago to head the company's expanding scope of sales and services covering its products, Chicago Fly Ash and Water Slag. Mr. Lovewell has specialized background including research at the U.S. Bureau of Standards, service engineering for the Louisville Cement Company, and as chief engineer and sales manager for the Carney Company, Mankato, Minn.

Immediately prior to his current activity, Mr. Lovewell headed sales and service engineering for the cement and lime producing industries for the Pioneer Engineering Works, Inc., of Minneapolis.

Officials of Combustion By-Products Company also have announced that they are retaining the services of Norman H. Withey to represent them in their technical problems and to direct an expanded research program on Chicago Fly Ash and Water Slag.

A 1932 graduate of civil engineering at the University of Wisconsin, Mr. Withey operates a concrete special products business in Madison, Wis., but will devote most of his time to technical work in this new connection. Research work while with the Portland Cement Association gives him pertinent experience. He is a member of A.S.T.M., A.C.I., the Highway Research Board, and the Wisconsin Society of Professional Engineers. He is also co-holder of the Wason Medal for Research of the American Concrete Institute.

C. E. Lovewell

Three Executives Appointed At Beckley & Myers Company

Officials of the Beckley & Myers Company, Springfield, O., ready-mixed concrete producers, have announced three new appointments, as follows:

Russell P. Mumford is now vice-president and general manager of the firm; Warren Brenner is vice-president and sales manager; and Robert Yoakum is superintendent.

Henry Beckley is president of the concern, which is just beginning its 57th year in business.

New Kankakee Block Plant Soon to Begin Production

The new plant of the Kankakee Block Company, Inc., at Kankakee, Ill., is scheduled to be in production soon, equipped with a fully automatic, one-man Stearns "15" block machine.

Among the other Stearns items in the plant are a 50-cu. ft. mixer, standard attachments, racks, pallets, weighing batcher, bins, elevators, conveyors, and complete handling and storage equipment for aggregates and bulk cement.

Hensley Concrete Products Company, Newton, Kan., has been appointed exclusive distributor for Armor Laboratories line of waterproofing products, concrete paints, etc.

Makers of Soo-Crete Units Install Automatic Machine

On August 1 the Concrete Products Company of Sioux City, Ia., manufacturers of "Soo-Crete" concrete block and related concrete structural materials, installed a Stearns "15" block machine, which replaced a "No. 9" Joltcrete, in use since 1947.

So successful was the Joltcrete in turning out block for the growing business that the management decided to convert the operation into a fully-automatic plant. G. R. Batchellor is president of the concern; and Lyle Ballantyne is manager.

Anchor Concrete Step Co. Opens Plant at Decatur, Ill.

At Decatur, Ill., the Anchor Concrete Step Company held a formal opening of its plant on July 29. Precast concrete steps in various sizes are the products of the firm, which is operated by Ted Bates and L. T. Ponsness.

The sets of steps are cast in adjustable forms and can be made in sizes from 4 to 6 ft. wide and from one to four steps high. Anchor will supply and install the units at points inside a 35-mile radius from Decatur.

Graystone Concrete Products Making Precast Catch Basin

A newly-announced product of the Graystone Concrete Products Company of Seattle, Wash., is an offset precast concrete catch basin. The unit is cast in two sections—a base with the bottom cast integrally with the sides, and a top, which is tapered to fit the standard rectangular inlet top approved by the City of Seattle.

According to R. W. Condon, sales manager, the new catch basin can be set directly in the hole by a truck crane, even under wet weather conditions.

Donovan-James Builds Plant At Albeni Falls Project Site

At the Albeni Falls Project site, Albeni Falls, Idaho, Donovan-James has erected a plant with a capacity of 58 cu. yd. per hour. The cement silo holds 2,700 bbl. or four hopper carloads, and the storage bin of the plant proper holds another 330 bbl. of cement and 314 cu. yd. of aggregate.

First pour for the $31,070,000 dam required two hours and involved 500 cu. yd. of concrete. Pouring is to continue until mid-October.

Texas Aggregates Concern Acquires Louisiana Plants

The Acme Cement Products Company, Natchitoches, La., and the Lalite Blox, Inc., Shreveport, La., have been purchased by the Texas Lightweight Aggregate Company, Dallas, Tex.

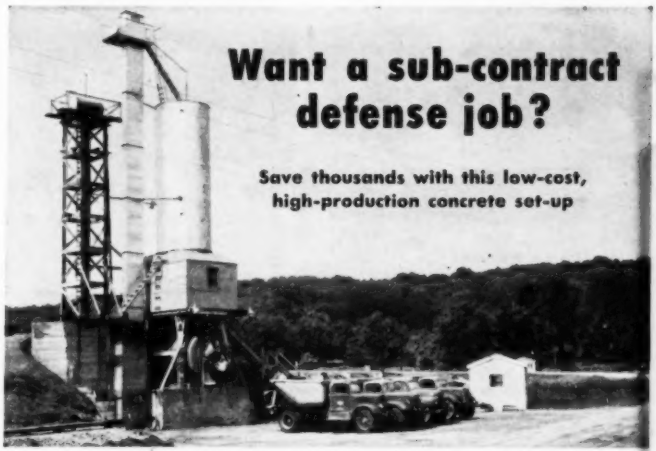
V. L. Nance, and H. Sibley, general manager and assistant manager of Lalite, respectively, will continue in these posts under the new ownership. This concern was founded about a year ago. The Acme Cement Products Company, organized in 1946, was headed by Dr. W. H. Pierson, president, Richard de Vargas, vice-president, and Sam Hicks, manager.

Peckworth of A.C.P.A. Invited To Advise Eire on Drainage

Howard F. Peckworth, managing director of the American Concrete Pipe Association, has returned from a three-weeks' stay in Ireland, where he headed a three-man team of American experts on farm drainage problems.

Mr. Peckworth and his associates, Dalton G. Miller of the University of Minnesota and W. C. Lynes of the Mason City (Iowa) Brick & Tile Company, were invited by the government of Eire to make a survey and write a report on that country's farm drainage situation and to stimulate industries to produce concrete farm drainage tile and also clay tile. During their stay in Eire the team traveled 2,500 miles to inspect farm land and peat bogs. They also consulted with government officials and advised them on land rehabilitation and proper drainage methods.

Hans P. Domine, 66, president of the Domine Builders Supply Co., Rochester, N. Y., died on May 31 after a short illness. Mr. Domine invented a machine for the manufacture of concrete roofing tile.



Want a sub-contract defense job?

Save thousands with this low-cost, high-production concrete set-up

Keep your eyes open. Any day now you'll hear of a big defense job nearby. They'll need a lot of concrete—perhaps more than your annual production. You can get this business. Do it like Richter of Cincinnati.

He bid low on a new power plant near him, but too far to supply from his plants. So he built the low-cost hillside central mixing set-up shown above. Note the bulk cement bin, elevator and ramp at rear where batch trucks dump directly into 3-yard mixer. This simple set-up saved him money.

But his big saving came from using four Dumpcretes instead of transit mixers. These concrete bodies cost less to buy, to run and to maintain.

They gave him top production—up to 500 yards on an 8-hour shift. Dumpcretes dumped directly into buckets, forms and piling. Their downtime and maintenance was practically nil, because of their simple, rugged construction.

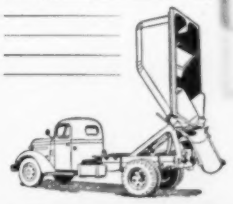
When this job was finished he moved the whole set-up to a larger job—60,000 more yards. What more can you ask . . . low investment, portability from job to job, increased production, customer satisfaction, and the pay off—greater profits. Send for the complete story today.

Please send booklet "12 Ways To Set-Up For Central Mixing."

Name_____

Firm_____

Address_____



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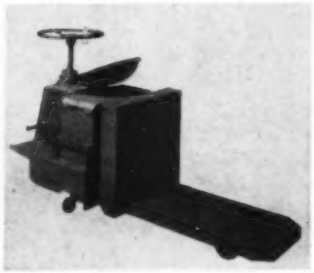
Handling materials on skids or racks in cramped spaces is facilitated by the "Load-Mobile" narrow electric lift truck. This truck has a platform only 18 in. wide and is available in several lowered heights to engage standard platforms.

Special stabilizing casters are used on



the side to prevent tipping when turning corners. These casters are retracted when not needed for stabilizing.

The truck is battery-operated and features 3-way operating positions for safety, comfort, and maneuverability. It is manufactured by the Market Forge Company, Everett, Mass.

● Electric Lift Truck

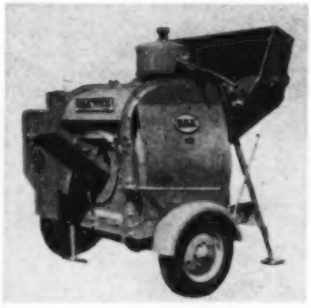
A 2,000-lb. capacity fork lift truck, the "Lift King," is being manufactured by the Philadelphia Division, Yale and Towne Manufacturing Company, 11,000 Roosevelt Boulevard, Philadelphia 15, Pa.

The truck features simplified automotive-type controls, hydraulic lift, and compact size. A magnetic contactor control interposes a time delay between speeds for smooth acceleration, which

prevents jack-rabbit starts that might shift loads and damage the motors, and reversal of travel is possible only in first speed. Hypoid gearing, inclined king pins, and hydraulic brakes are additional features of the new models.

● Portable Concrete Mixer

A 6-cu. ft. mixer for fast production on small jobs is the Rex 6-S. This model has the water tank located on top of the mixer to give faster water entry. An unbreakable clear plastic check valve



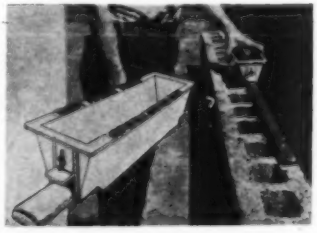
permits visual operation of the water supply.

A one-arm clutch and brake control simplifies operation. Pillow blocks have replace bushings on the counter shaft, and bearings are used on the winding drum. Other features such as one-man spotting, low center of gravity, chain drum drive, and sturdy, lightweight construction are included. The Chain Belt Company, Milwaukee, Wis., is the manufacturer.

● Mortar Plane

A mortar plane designed especially for applying uniform thicknesses of mortar on concrete block is now being made by the Kakest Company, Curwensville, Pa.

The device consists of a lightweight box or trough that holds the mortar. This



is spread on the block in a uniform ribbon, the thickness of which is controlled by an adjustable end gate. The trough rides on the surface of the block so that the ribbon of mortar is uniform. It is claimed that the mortar plane can be operated at least four times as fast as by hand troweling and with virtually no spilling of mortar. One filling of the plane is sufficient to cover up to six blocks. Professional users are said to increase speed of mortaring 400 percent, while amateurs can obtain speed equal to that of professionals using other methods.

● Pipe Tamper

Pneumatic tamping of concrete pipe is easily achieved with the "Airtamp" system for applying air pressure to the tamping stick.

The device is said to give a closely controlled and uniform pressure to the tamper slides, so that a controlled density of the concrete in the pipe is created. A regulator that controls the pressure is a part of the installation. Pressure can be varied easily and rapidly to meet various conditions at the machine. A small air compressor such as those used in filling stations is all that is needed to provide a line pressure of 100 lbs.

Airtamp is a product of the Eckel Engineering Company, P.O. Box 528, San Jose, Calif.

H. E. Gallison

F. J. Whelan, sales vice-president of Worthington Pump and Machinery Corporation, has announced the appointment of Herbert E. Gallison as manager of the Industrial Mixer Sales Division, with headquarters at the Dunellen, N. J. plant. He succeeds J. C. Lukas, who has resigned.

Mr. Gallison joined Worthington's Construction Equipment Division as sales engineer in the southeastern region in 1946, becoming assistant to the regional manager of the central region in 1947, and central region supervisor of the Industrial Mixer Division in 1949.

Appointment of Cecil M. Spekker as purchasing agent for Mixermobile Manufacturers, 8027 N. E. Killingsworth, Portland, Ore., has been announced by Gus Wagner, general manager of the firm.

Since 1939, Spekker has been employed by the Wagner brothers who, with their father, the late Ed Wagner, founded Mixermobile Manufacturers. He first was employed on construction projects by the Wagner Construction Company and later went to work in the Mixermobile Manufacturers shops.

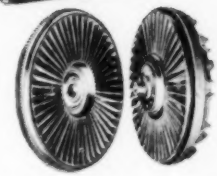
After serving in World War II in Europe, he returned to Mixermobile Manufacturers, where he worked in the shops and in the drafting department. During the last year he has been employed on production control.

Mr. Spekker replaces Roy Faist, who recently resigned from the post of purchasing agent.

The Posey Iron Works, Inc., Lancaster, Pa., has been granted trade registration of the name "Lancaster" by the U. S. Patent Office. This trademark covers a wide variety of Posey equipment, including batch mixers, automatic brick-forming machines, pallet car loaders and its full line of clay processing equipment.

Lick "down-time" with YALE 3-POWERED ECONOMY

FLUID DRIVE

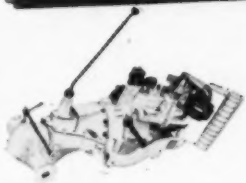


Exclusive! Increases clutch life. Gives unfailing, smooth, full power at any speed even on steep ramps. It's the same *fluid* coupling used on fine passenger cars, adapted to heavy industrial use.

HYPOID GEARING

Exclusive! A rugged, over-capacity, yet compact drive. Fully enclosed against dirt and other sources of wear. 4-pinion drop-forged differential with "floating" axles take road shock in stride.

65 HP ENGINE



Exclusive! A cool-running, 6-cylinder industrial engine that gives full floating power at all times. All-weather waterproof ignition. 4-point stress-free, rubber cushioned mounting kills vibration strain and wear on truck.

Only YALE gas trucks give you these 3 money-saving features that keep trucks on the job

LICK "down time" and you knock out the big cost factor in gas truck operation. You keep your production rolling steadily, at peak levels—while your truck operating costs stay at rock bottom.

YALE, and only YALE, fork-lift gas trucks can give you this big plus—extra strength, extra power, extra precision-geared smoothness throughout the "power line" from engine to differential. Exactly where it's needed most!

While other trucks are "down for repairs" this one *keeps on* moving materials in close quarters, on long hauls, indoors or out, stacking loads nearly 16' high.

That's why YALE 3-powered economy means *more work done every day* plus *more days on the job!* Find out now about putting this economy in your plant.

YALE & TOWNE

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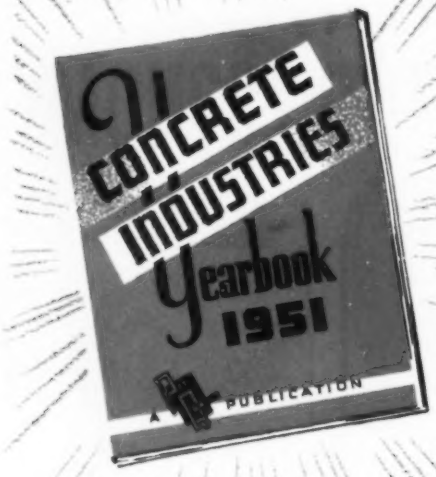
YALE GAS AND ELECTRIC INDUSTRIAL TRUCKS • YALE WORKSAVERS • YALE HAND TRUCKS • YALE HAND AND ELECTRIC HOISTS

IT'S BIG • IT'S FACTUAL! • IT'S COMPLETE!



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Largest in its History... incorporating all the latest available information on machinery equipment and processes

Thoroughly Re-edited—Pages of New Information

Because of the rapid growth of the industry in the past few years, and the important technological developments which have accompanied that growth, the Yearbook has been re-edited from front cover to back. Pages of new information, drawn from the experiences of the industry's outstanding producers, have been added to make this edition more than ever the indispensable text book of the concrete field.

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Established producers and newcomers alike will find in this bigger and better Yearbook a wealth of well-arranged, specific operating information to assist them in solving production problems and increasing profits. Plant design, the selection and characteristics of raw materials, batching, mixing, curing, handling and marketing are just a few of the important subjects treated.

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THE WAY TO YOUR *FULL* SHARE
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cubic feet of drum space

result: more payload
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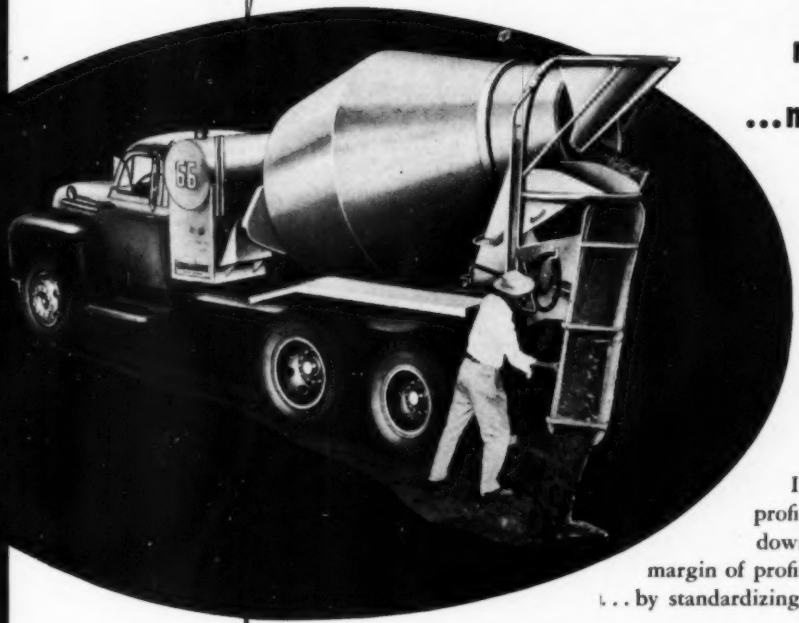

In these days of mounting costs, profit margins have a way of slipping downward. You can guard your margin of profit and boost it up substantially ... by standardizing on Challenge Truck Mixers.

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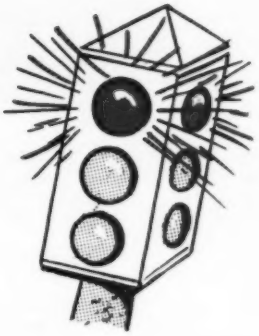

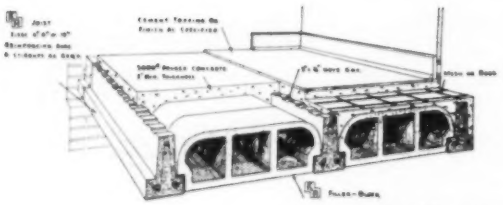

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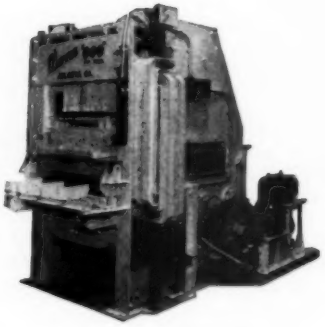
You can qualify for exclusive rights in your trade area if you are financially sound and have a reputation for making quality concrete products and giving service.

WARREN "800" AUTOMATIC BLOCK MACHINE

"None Finer—None Faster"



- 1ST MACHINE TO PRODUCE OVER 600 BLOCKS PER HOUR.
- SYNCHRONIZED ECCENTRIC VIBRATION
- AUTOMATIC HEIGHT CONTROL

ROCKERCRETE
Semi-Automatic
BLOCK MACHINE

WE INVITE INQUIRIES AS TO FUTURE DELIVERIES OF THE WARREN "800"

CAPACITY APPROX. 1800 BLOCKS PER DAY. IMMEDIATE DELIVERY ON MACHINE & ALL ALLIED EQUIPMENT.

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COMPLETE CONCRETE BLOCK PLANT EQUIPMENT

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"TAKE A LOOK JOE"!...

...I made this cut with my new CLIPPER in just 10 SECONDS!

"...and Joe, look at the smooth, straight edges on that material—they're perfect! The finished job looks better, costs less and can now be completed in record time."

NINE MODELS TO CHOOSE FROM
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Yes... CLIPPER MASONRY SAWS Make *Any* Cut Quickly and Easily!

Regardless of the material hardness—a Clipper Masonry Saw will cut any shape in record time and with smooth simplicity that will amaze you. . . . And with the MODEL HD you can choose your cutting method — cut DUSTLESS in confined areas or Dry for outside operations. Remember too, there are NINE Clipper Models—each designed to economically handle your specific masonry cutting needs.

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The outstanding policy of "FREE TRIAL" has been in effect since Clipper invented the world's first Masonry Saw many years ago! Only through this Clipper "FREE TRIAL" are you guaranteed . . .

- ACTUAL TEST ON THE JOB
- FULL SATISFACTION
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Masonry cutting is a highly specialized field demanding direct Factory-To-You service which Clipper trained technicians can give you.

Your assurance of permanent satisfaction with your Clipper Products is doubled by our Policy of . . .

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- DIRECT RESULTS..

EXCLUSIVE CLIPPER FEATURES...

PRESSURE EQUALIZER
Makes your Blades last longer . . . Because Equalizer Spring automatically cushions blade pressure whether cutting 16MO or SOFT materials. Outstanding for blade economy.

SELECT-A-NOTCH
One man easily adjusts Cutting Head to desired height . . . Whether cutting 12" or 1" material. Operator's hands merely guide. Weight supported by rear bar.

SAVE-A-BLADE DIAL
Just turn the Save-A-Blade Dial to the material hardness and the Pressure Equalizer Spring automatically sets the tension — insuring faster cutting and longer blade life.

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Pull the knob — and the Cutting Head is free for finger-tip setting at any desired angle. Release the Knob — and Head is locked in the desired position.

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No need to remove belt when cutting dry. No maintenance . . . Factory Sealed . . . An exclusive Clipper development. Patented Water Application Unit controls flow.

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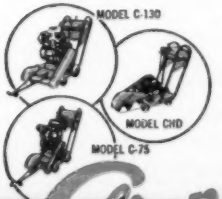
From ONE SPOT at the front of his Clipper the Operator performs every cutting operation and makes every saw adjustment.



...and Now Available- CLIPPER CONCRETE SAWS

Six new "Job-Tested" models—gasoline or electrically powered and in sizes for all concrete cutting from Highway work to Patch work . . . and exclusive with Clipper—a unit which converts a masonry saw to a Concrete or Track Saw. Free literature on request—check and mail coupon.

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SELL SWAP BUY

100,000 Pressed Steel, Aluminum and Cast Iron Pallets.

In Stock Size	Kind	Price
3"	Steel	28c ea.
3"	Steel	32c "
4"	Steel	38c "
4"	Aluminum	38c "
4"	FC George Welded	25c "
6"	Steel	49c "
8"	Steel	52c "
8"	FC George Welded	35c "
8"	Aluminum	52c "
8"	Steel	35c "
10"	Steel	65c "
12"	Steel	85c "
12"	Cast Iron	45c "

BLOCK MACHINES

1—#7 Joltcrete Plant Complete — $6000.00. Consists of #7 Joltcrete Stearns Skip, Kelly Mixer, 2500—8", 3000—4", 1000—12".

1—Stearns Model A Clipper Stripper, Complete, Perfection Condition. $995.00

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1—FC George, Hydraulic Block Machine, Mixer & Conveyor, 2700—8" pallets, 1000—4" pallets....$2000.00

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1—30 cu. ft. Kelly & Stearns 28 ft. Skip $2100.00

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1—42 cu. ft. Stearns Skip....$1700.00
1—28 cu. ft. Stearns Mixer....$1500.00

MISCELLANEOUS

60—Steel Chase Racks, 72 Block Capacity. Each $15.00

WE BUY COMPLETE CONCRETE BLOCK PLANTS

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Used Equipment Divison
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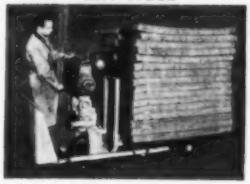
TRUCK-MAN gas powered Model D Hydraulic Skid Lift Truck



Demonstrator, like new, capacity 3500 lbs. 54 inch bed, 27 inch wide. Pneumatic tires rear, solid tires front. Price $750.00.

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1—Stearns No. 7 Joltcrete with power carriage, relinable attachment with 2500 "Dacolt" and "Darnell" P. S. Pallets. Installed 1951.
1—Stearns No. 7 Joltcrete with power carriage, relinable attachment with pallets same as above.
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1—Attachment with 5000 "Zonal" P. S. Pallets. Both machines operating in Newport News, Virginia. Replacing with larger Stearns Machine.

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#200 Martin Pipe Machine 4" to 24" pipe size $5600.00 includes 50 HP motor, 5 HP motor and switches for both. Also chain conveyor part of machine. Machine guaranteed to be in good condition as it has had very little use. Hydraulic system.
Large quantity Rings and Jackets available at 25% present cost. Trowlers, wings, etc. for machine available at same discount. These items are new.

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Block Plant for sale located in Orange County, New York. Plant includes:
Besser K3
Erickson fork lift truck
Kent #6 Continuous Mixer
Overhead storage for aggregate and bulk cement
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Located in gravel bank, rent free. Must sell immediately. Price $12,000. Terms can be arranged.

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FOR SALE OR LEASE

10 Jaeger Hi Dump 3 Yd. Truck Mixers
2 Rex Hi Dump 3 Yd. Truck Mixers
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All Mounted on K-8 Internationals

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Reed Model 750 Vi-Brik-Crete semi-automatic power operated Brick Machine complete with feed drawer and 450 plain steel pallets. Price $475.00

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18—60 Block all steel curing racks for 18" x 18" steel pallets in very good condition, used less than 1 year. Price .....$36.50 Each

Russell Concrete Products Co.
Sturgis, Mich.

FOR SALE

1—#9 Stearns Joltcrete
1—#7 Stearns Joltcrete
Approximately 22,000 Pallets
4"—6"—8"—12"
Stearns Mixers—Skips, compressor
Volume batchers—turntables
Lots of parts—molds—cores, etc.

A complete operating plant is discontinuing block operations, this machinery priced at fraction of original cost. Available after September 15, 1951.

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(1) Model A Clipper Stripper Block Machine with 4" — 8" — and 12" mold boxes. Excellent condition. Will sell complete for $995.00.
(1) 1½ Cubic foot mixer. Good condition. $195.00.

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400—Steel Pallets 18" x 18" x ¼" at $1.70—never used.

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FOR SALE BRAND NEW BELT CONVEYOR eighteen inch, 110 ft. long with pulleys, drives, everything but motor.

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Brickcrete Machine, or Machine making similar Product. Prefer complete plant. Will pay 22 cents on the dollar of original cost.

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Both McCracken Type and Martin Trowelers—PROVED to last as long or longer—yet cost considerably less. Write for prices.

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MINERAL COLORS

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BRICK MORTAR
STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.

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1000—Full 10" Ribbed Steel Pallets
45% Cores—With Mortar Grooves
These pallets have never been used and are priced to sell. $0.60/EA FOB Roanoke.

ILLINOIS BUILDERS MATERIAL CO.
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½ Million Dollar Inventory

Two: 2436—one: 1836 Jaw crushers, Symons 3 ft. Cone—Two: No. 8 Gyratory, Two: No. 10—Two: No. 12. 150 KVA Transformers, 50 sets conveyor idlers, Compressor, Shafting pulleys, Conveyors, Drive Belts, Timber, Shovels, Cranes, Drill Steel, Tractors, Screens, Pipe, Rails, Motors, Bucket elevators, Ready Mix Plant Bins 3 compartment with 2 beam scale.

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Besser Vibropac plant complete, including 4", 8" and 12" mold boxes, skip loader, mixer, all starters, switches and motors, forked lift truck, Hough Payloader, racks and pallets.
Can be seen operating any day.

THE RIVERSIDE CONCRETE COMPANY
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FOR SALE

1 Stearns Model A Clipper Stripper with attachments—Good Condition.
Various cored pallets.
40 Steel racks, 72 block capacity, for plain pallets 18 x 18—Excellent condition.

STANDARD CONCRETE PRODUCTS CO.
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3—1951 LF192 International Tandem Trucks with 4½ Cu. Yd. Hi-discharge Mixers.

1—1947 EHU Mack Truck with 3 Cu. Yd. Hi-discharge Mixer.

1—1947 KVS10 International Truck with 3 Cu. Yd. Hi-discharge Mixer.

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FOR SALE 20 CONCRETE MIXERS AND TRUCKS

TRUCK
- 6 Wheel Marmon-Herrington Chassis
- 450 Red Diamond International Engine — Lipe Roll-Way Clutch
- Fuller 5 Speed Transmission
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- 11.00 X 20 Tires

MIXER
- 4½ Cubic Yard Mixer—6⅛ Cubic Yard Agitator
- Rex and Jaeger Makes—Separate Engines Drives
- Hi-Discharge
- Mixers Have Been in Service 1½ Years

Both Trucks and Mixers are in operation and in good mechanical condition.
PRICE: $7,500.00 for each Truck and Mixer unit at location.

Write or call — Attention of Mr. Fish.

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FOR SALE

1—Go-Corp Crown Prince, 2-unit plain pallet block machine; with 8" regular attachment, including corners, sash and fractionals. Also 12" regular attachment including corner and sash. Attachment for (4) 4"x8"x16" solids. 16"x16" chimney attachment for 8⅛"x 8½" square flue.

1—Pneumatic offbearer.

1805—¼"x17"x17" plain steel pallets.

47—Steel racks of 72, 8"x8"x16" block capacity.

Above equipment may be seen in operation. Reason for selling, installing larger equipment.

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PROMPT - SHIPMENT

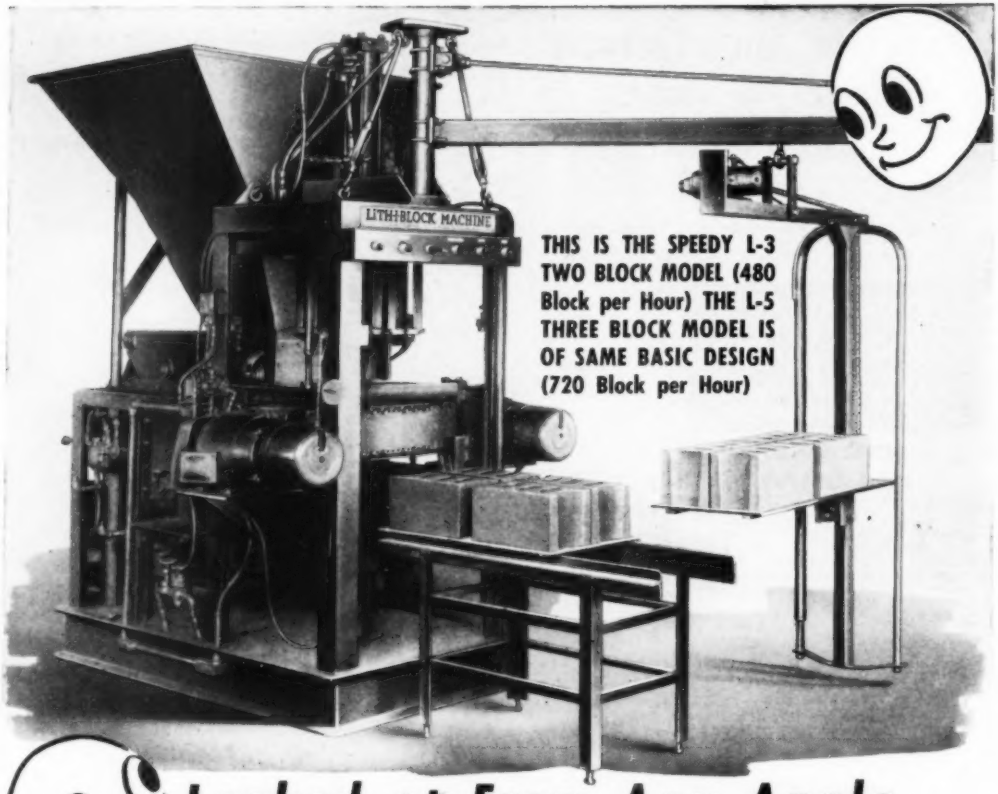
Ford Block Machines — 240 blocks per hour
Ford Mixers — can't be beat
Ford Conveyors, Cup or Belt, built to order
Ford Bins & Hoppers — any size. Built to order.

Ford Cement Block Mach. Co.
Cedar Falls, Iowa

UNBREAKABLE PALLET RINGS

Write for full information

TEXAS FOUNDRIES
LUFKIN, TEXAS



THIS IS THE SPEEDY L-3 TWO BLOCK MODEL (480 Block per Hour) THE L-5 THREE BLOCK MODEL IS OF SAME BASIC DESIGN (720 Block per Hour)

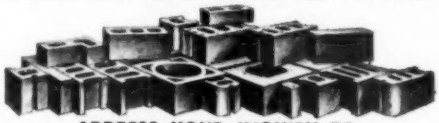
Looked at From Any Angle, It's The Machine That's Engineered To FIT THE AGE!

If your business can stand some streamlining — greater production efficiency — greater handling economy — greater time-saving in cubing and mold box changeovers — then the key to your whole program is found in the smoothly efficient straightline LITH-I-BLOCK Machine. Ask any LITH-I-BLOCK producer.

If you want to cut yourself a bigger slice of the concrete products market in your territory, then you have all the more reason for hitching your wagon to the LITH-I-BLOCK star — for it's a star that is rising higher and higher, brighter and brighter. Architects, builders, contractors and masons — all down the line — go for the clean-cut, uniform, perfectly finished masonry units turned out so accurately by the LITH-I-BLOCK machine.

Get set for the Age in which you are doing business — get the machine that Fits the Age — get going with LITH-I-BLOCK!

LITH-I-BLOCK



ADDRESS YOUR INQUIRY TO

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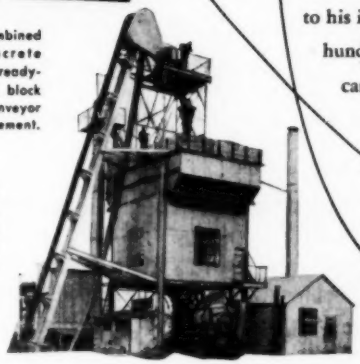
PLAN AHEAD for your READY-MIXED program———

and remember

YOU'LL DO BETTER WITH BUTLER

Butler Plant in Illinois is combined block and ready-mixed concrete set-up. Foreground bin is for ready-mixed. Rear bin supplies block plant. Both have common conveyor and extra storage for cement.

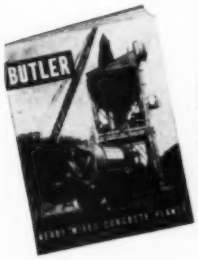


Compact ready-mixed plant requiring little yard space. This is one of three identical plants designed and built by Butler for a Detroit firm.

Whether you're planning to build, expand or modernize a Ready Mixed Concrete Plant — call in the BUTLER Engineer *now* to talk things over. It pays to give leisurely consideration to your planning — to allow time for study and discussion.

That's where the counsel of the BUTLER Engineer can serve you best. Help yourself to his experience; to his ideas. From his knowledge gained in planning hundreds of Ready Mixed Concrete Plants, *you* can reap the benefit of his ingenuity. For the BUTLER Engineer knows how to design for labor saving efficiency that shrinks costs and expands your profits.

So PLAN AHEAD with the BUTLER ENGINEER



Here's a good hunch for the first step in your planning. Send for BUTLER Bulletin 185. Shows pictures and drawings of Ready Mixed Plants the country over. Ideas that may mean much to you. *Write today.*

BUTLER BIN CO.

987 BLACKSTONE AVE. WAUKESHA, WIS.

MULTICO BLOCKMASTERS

they've got everything!

MULTICO BLOCKMASTERS *have got* everything the modern operator wants. Multiplex engineers build FULLY AUTOMATIC machines with a compression action unavailable elsewhere; a combination of VIBRATION, TAMPING AND PRESSURE for perfect blocks. They chose HYDRAULIC POWER for smoothness of action and originated the idea of making a SEPARATE POWER PAK CONTROL unit for easy maintenance and simplicity of design. The Blockmasters have INDIVIDUAL MOLD BOXES for instant block-style change, coupled with PLAIN PALLETS for making ANY SIZE and ANY SHAPE of block out of ANY AGGREGATE. Both of these TWO MACHINES, the 2-block cycle MULTICO No. 2, and the 3-block cycle MULTICO No. 3, have STANDARD REPLACEMENT PARTS.

Here's what Paul Patterson of Patterson Block Plant, Clark Mills, Penna., said in a recent letter—

". . . MULTICO Block machine, with automatic "Power-Pak", is giving us excellent results...will continue to do so since it is really heavily built and simple in design. The blocks it produces are possibly the best in the area . . ."

Multiplex engineers want to help you plan your plant expansion, and can offer you the automatic block machines, mixers, skip hoists and compartment aggregate bins that are required for successful plant operation.

MULTIPLEX Machinery Corp • Elmore, Ohio

IDLE EQUIPMENT WASTES MONEY

A good way to get back a large part of the money you spent for equipment you're no longer using is to SELL IT.

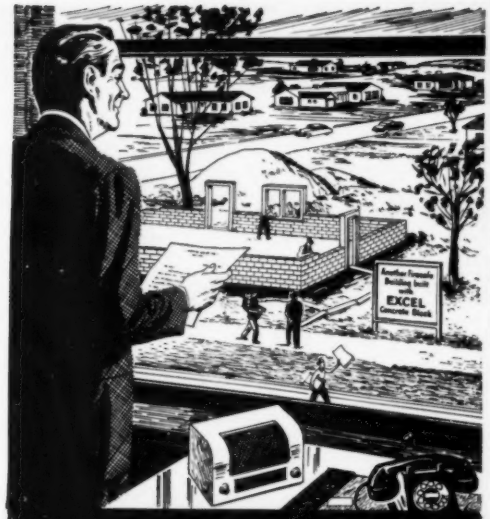
And the best way to sell it is through the Concrete Manufacturer, the Market Place for supplies and services.

Let someone else have the benefit of equipment you can't use in exchange for hard cash you can use in other ways.

So important is the Concrete Manufacturer used equipment section that many readers (and there are over 24,000 of them—all potential buyers) turn to it first when C M arrives on their desk.

Tell us what you have to offer for sale or trade, we'll set up the ad for you. Mail today and watch the results.

THE CONCRETE MANUFACTURER, 538 South Clark Street, Chicago 5, Ill.



Good Advertising Helps Sell CONCRETE MASONRY

AS EVERY successful businessman knows, making a quality product is not enough. Your product must be *sold*. Buyers must be convinced that your product is what they need.

The way to do that is to tell them why they should buy your product rather than others. That is the function of advertising. Advertising reaches the most people most economically.

Advertising may be a radio commercial, a newspaper ad, a listing in the classified directory of the phone book, a job-site sign, a television show, a demonstration house, a direct mail piece or a truck sign. Which one or combination of these or other kinds of advertising you use depends on their availability, your market and your budget. Used consistently, advertising builds preference and acceptance for your product.

Backed by personal selling to clinch the sale, advertising is another effective tool for building greater block sales in a business founded on the fundamentals of (1) making block that comply with ASTM or Federal specifications for dryness, strength and absorption, (2) showing quality concrete masonry buildings to prospects and (3) furnishing prospects names of architects and builders who can be depended upon to design and build quality concrete masonry structures.

PORTLAND CEMENT ASSOCIATION

33 W. Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete...through scientific research and engineering field work

Save 8 man-hours every day

with truck-man !"

And that's not hay! That's what block plant operators across the country tell us they save with this economical, rugged truck. One man's time . . . every day . . . the whole year 'round . . . *that* adds up!

You save up to $300.00 and more during the first month you put Truck-Man to work in your block or brick yard . . . and you continue to save at that rate during years of faithful, dependable Truck-Man service.

Truck-Man is a light, speedy, highly maneuverable truck that works a shift on little more than a gallon of gas . . . requires minimum maintenance . . . has simple controls any worker quickly learns to operate. The special 62" platform handles even 72 block racks . . . those extra big loads that mean more profit per trip between block machine and curing room. Various platform heights, widths and lengths available to suit your operation.

There's an extra dividend for you, too, in the gentle treatment your blocks get. Truck-Man's easy hydraulic lift and drop, soft *start* and *stop*, and rubber-cushioned ride spot your racks gently . . . no costly checking of green blocks to eat up profits.

New 1951 catalog describes three low-cost Truck-Man models. You owe it to yourself to get the whole story on this money-maker. Coupon brings your copy, at no obligation. Mail it now. Sales and service in 95 centers across the nation!

truck-man Div. of The KNICKERBOCKER CO.
571 LIBERTY ST. • JACKSON, MICH.

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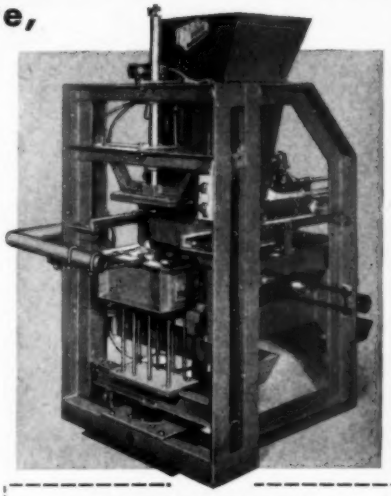
ADDRESS _____

CITY _____ ZONE _____ STATE _____

Get Into BIG TIME Operations and Profits

with the Relatively Inexpensive, But Highly Efficient

KENT STANDARD BLOCKMAKER



The large volume block producer enjoys the competitive advantage of low costs due to labor saving machinery. But he does so only through a tremendous capital investment. And he must be assured of a continuing volume of business to justify the outlay.

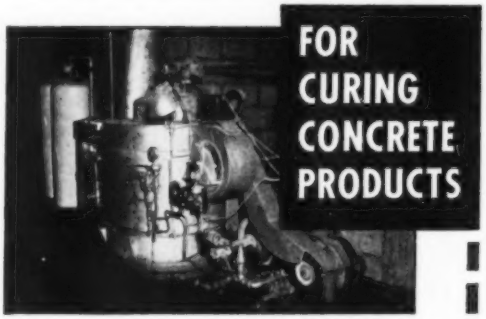
But what of the medium or small operator in territories where such vast demands do not exist; or the large operator who wants additional capacity to meet peak load demands?

Kent had these folks particularly in mind when they developed the KENT Standard Blockmaker. It gives them the advantages needed to meet BIG TIME competition. And the investment required is SURPRISINGLY LOW.

There are interesting facts leading to extra profit available to you. Can be obtained with ROCK BASE ATTACHMENT.

The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO
Manufacturers of
CONCRETE PRODUCTS MACHINERY SINCE 1925

Send Blockmaker Literature to
Name
Address
City



FOR CURING CONCRETE PRODUCTS

LITTLEFORD
"Kwik-Steam"
Vapor Generators

Curing of Concrete Products now can be done at the minimum of cost by using a Littleford "Kwik-Steam" Vapor Generator. These small, compact units are the fastest steam producing generators ever designed. They will produce steam in 2 minutes time from a cold start, are low cost in operation as they burn fuel oil and only produce steam when steam is needed. The "Kwik-Steam" Generators are completely automatic; no special trained operator is needed to run the Generator. Made in models to fit any size curing room. Sizes from 20 to 165 B.H.P.

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GREEN BROWN
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TURN CONCRETE INTO GOLD

With the Famous

MARVEL JR.

CONCRETE DRAIN TILE MACHINE

Produce flat-end drain tile in various sizes and combinations at record low cost. Quick profits for you in steady paying business, demand far exceeds production. Machine ready for use when it arrives—will pay for itself and a profit in a few days. Write for Drain Tile Bulletin.

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SIMPLICITY ECONOMY DEPENDABILITY

OSWALT SERVICE

is a proven method of increasing the production rate of a standard Vibrapac machine from 600 to 900 blocks or more per hour *without sacrifice of quality.*

This is a completely engineered job that carries a positive guarantee of performance. The mechanical conversion of the machine requires special parts and adjustments, supplied by Oswalt.

The "know-how" and experience of the Oswalt organization assures successful results . . . and the installation is *simple, effective and dependable.*

Oswalt Service enables you to realize greater output and higher income from your present Vibrapac machine . . . and you can pocket an additional profit of at least $60.00 per day from your operations.

45 Satisfied Customers operating 54 Machines

Ask for our New Booklet, OSWALT SERVICE

WRITE OR PHONE
for name of the Oswalt-Serviced plant nearest you.

OSWALT ENGINEERING SERVICE CORP.

1335 Circle Avenue, Forest Park, Illinois **Phones: ESTebrook 8-3666—FOrest 6-3898**

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RESEARCH DEPARTMENT
538 South Clark Street Chicago 5, Illinois

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- ☐ Air Compressors
- ☐ Air Entraining Agents
- ☐ Autoclaves
- ☐ Bag Cleaners
- ☐ Batchers
- ☐ Batching Plants
- ☐ Belting (Rubber)
- ☐ Bin Gates
- ☐ Bin Level Controls
- ☐ Bins and Batching Equipment
- ☐ Blades, Masonry Saw
- ☐ Block and Brick Machines
- ☐ Boilers
- ☐ Bucket Loaders
- ☐ Buckets, Concrete
- ☐ Buckets, Elevators
- ☐ Buggies, Concrete
- ☐ Bulk Cement Handling Equipment
- ☐ Bulk Cement Storage Plants
- ☐ Calcium Chloride
- ☐ Car Pullers
- ☐ Colors, Cement and Mortar
- ☐ Conveyors, Belt
- ☐ Conveyors, Portable
- ☐ Conveyors, Screw
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- ☐ Joist & Slab Machines
- ☐ Kilns, Curing Concrete
- ☐ Lift Trucks, Electric
- ☐ Lift Trucks, Gasoline
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- ☐ Lightweight Aggregates
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- ☐ Meters, Water
- ☐ Meters, Sand Moisture
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- ☐ Mixers, Concrete (Continuous)
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- ☐ Reinforcing Equipment
- ☐ Sand-Lime Brick Machinery
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- ☐ Scales
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- ☐ Skip Hoists
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- ☐ Testing Equipment
- ☐ Tile Machines, Drain
- ☐ Tile Machines, Roofing
- ☐ Towers
- ☐ Truck Bodies, Ready-Mixed Concrete, Non-Agitating
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INDIVIDUAL .....

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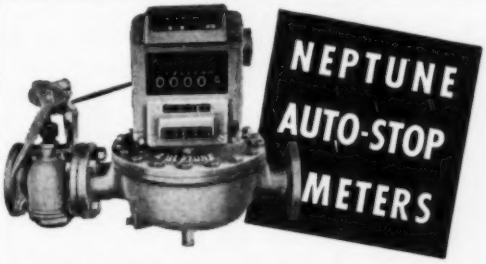

ACCURATE WATER CONTROL —*Automatically*

Accurate Auto-Stop meters are the quickest, most dependable way to control water in ready-mix batches. Just push buttons to set the quantity, open the valve, and the Auto-Stop does the rest. It automatically shuts off when the correct amount is delivered. Saves work, speeds loading. Large, easy-to-read numerals. Sturdy, weatherproof register has emergency stop, quick resetting, and totalizing features. Sizes for all ready-mix plants. Write for quick facts, or phone our nearest branch.

NEPTUNE METER CO. • 50 WEST 50th STREET • NEW YORK 20
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Have a Free Demonstration

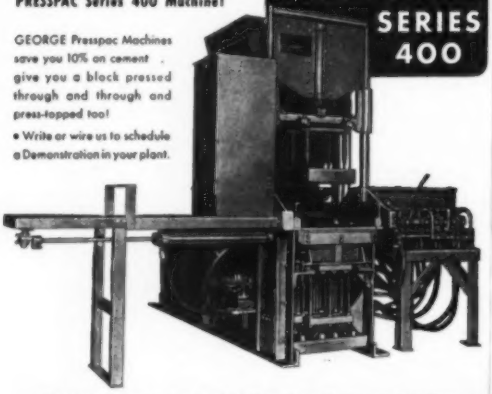
..in YOUR plant..using YOUR aggregate!

Your Men Can Turn Out from 7 to 10 Concrete Blocks Per Minute Anytime on a GEORGE PRESSPAC Series 400 Machine!

GEORGE Presspac Machines save you 10% on cement . . . give you a block pressed through and through and press-topped too!

• Write or wire us to schedule a Demonstration in your plant.

THE GEORGE PRESSPAC SERIES 400

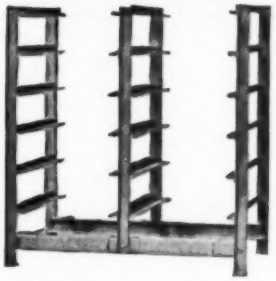


"ABSOLUTELY THE FINEST TWO-BLOCK MACHINE ON THE MARKET"

F. C. GEORGE MACHINE CO.
100 SOUTH WESTMORELAND DRIVE • ORLANDO FLORIDA

CHASE BLOCK RACKS, CARS, PALLETS

Corrosion-Resistant Hi-Strength Alloy Steel



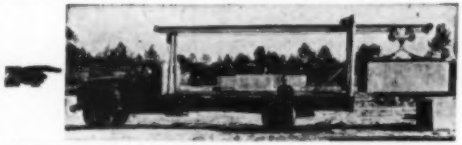
For Fork or Platform Lift Trucks

CHASE — THE LAST WORD IN
- *DURABILITY*
- *ECONOMY*
- *EFFICIENCY*

Sturdy construction • any style or capacity • Shipped knocked down • Rigid Field connections • assembled Easily

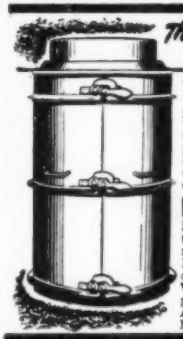
CHASE Foundry & Mfg. Co.
COLUMBUS 7, OHIO

A "Profit-Pointer" for Concrete Producers



CARPENTER Septic Tank Forms and Equipment are popular and profitable throughout the country because they insure maximum output of a quality product, on a minimum cost basis. Only one man is required to operate the above CARPENTER Delivery Rig. Write today for details.

CARPENTER MANUFACTURING COMPANY
Phone 22018 R.F.D. No. 1, Box 470
Richmond, Virginia



The "Quinn Standard"
FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost. **WRITE TODAY.** Complete information, prices, and estimates sent on request. Also manufacturers QUINN CONCRETE PIPE MACHINES.

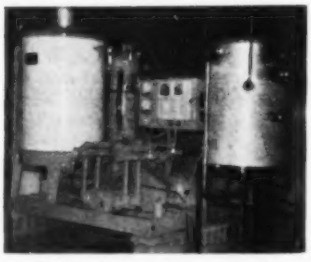
QUINN WIRE & IRON WORKS 1627 12TH ST. BOONE, IOWA

A NEW SERVICE TO BLOCK PLANTS

We make an engineering survey of your present steam curing system, boilers, piping, doors and kilns.

Our report and recommendations show what changes to make to get better Steam Curing Service.

For further information write to

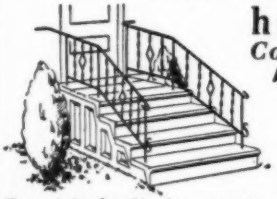


SHORE ENGINEERING 320 Broadway New York

NOW MORE THAN 110 *LICENSED MANUFACTURERS Producing*

Patented
homeward *Concrete* **STEPS**

A Small Investment That Pays Big Dividends



Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open.
For Complete Information Write
ROGER F. WILLIAMS, Licensor
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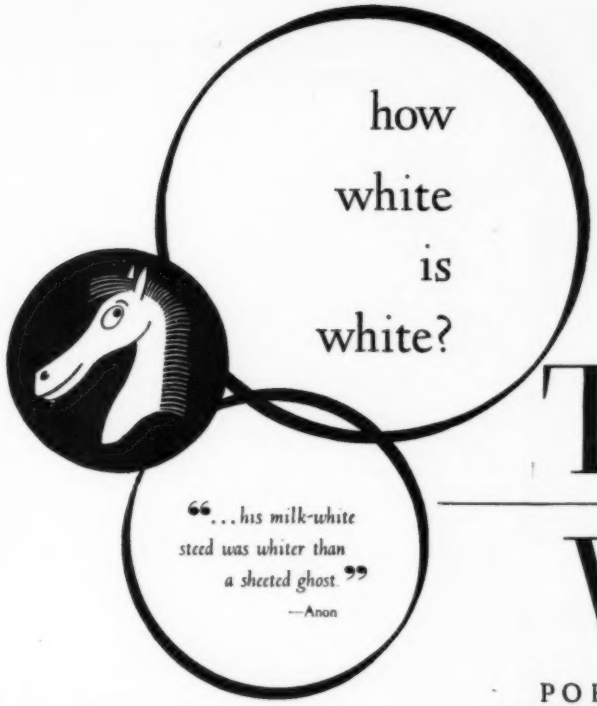


Use Trinity White—the *whitest* white cement. Trinity White is a true portland cement. It meets all Federal and ASTM specifications. Sell Trinity White for architectural concrete units, terrazzo, stucco, paint, ornamental work, tilesetting, etc. When ordering ask for it by its full name *Trinity* White—it's widely advertised to your trade.

Trinity Division, General Portland Cement Co., 111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 W. 5th St., Los Angeles.

Trinity White

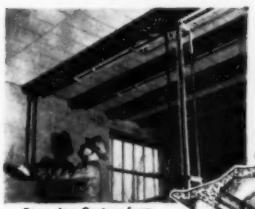
PORTLAND CEMENT

Looking for Used Equipment?

Refer to the listings in this issue for a wide variety of used and surplus machinery and supplies.

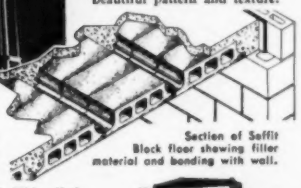
SELL MORE BLOCK ON EVERY JOB!

Furnish VIBRAPAC SOFFIT BLOCK for ALL FLOORS and ROOFS



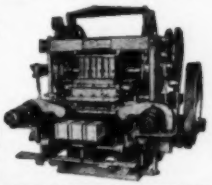
Removing Centers from Finished Floor.

Permanent, Fireproof Floors and Roofs. Low initial cost and maintenance. Natural base for radiant heat installations. Provide surface of maximum acoustical and insulation value. Can be plastered, or if left exposed, makes a ceiling of beautiful pattern and texture.



Section of Soffit Block floor showing filler material and bonding with wall.

Soffit Block are supported in place with temporary adjustable steel centers while reinforced concrete slab is placed and cured. This eliminates timber shoring and leaves space below clear during construction.



BESSER VIBRAPAC PRODUCES SOFFIT FLOOR AND ROOF UNITS

The same machine that produces high quality concrete masonry units in all styles and sizes, using Plain Pallets. Continuous, full capacity operation. Fully automatic. No machine operator required.

BESSER MANUFACTURING CO.
ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Products Plants

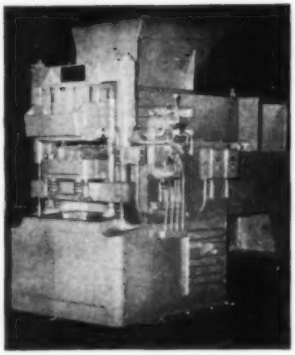
A 5867-¼R2

YOU'LL MAKE MORE BLOCKS WITH A *Columbia!*

HERE'S WHY

- PLAIN PALLETS
- VIBRATION PLUS COMPRESSION
- 4-6 AND 8 INCH HIGH BLOCKS
- 4 TO 6 PALLETS PER MINUTE
- OIL HYDRAULIC
- ANY TYPE OF AGGREGATE
- AUTOMATIC OR SEMI-AUTOMATIC

Write home office for name and address of sales representative in your area.



Columbia MACHINE WORKS

105 MAIN STREET • VANCOUVER, WASHINGTON

Meeting Load Limitations *with* High Capacity at LOW COST!

Hi-Lo TRUCK MIXER

Ask the Fleet Owners. Names on Request.

HI-LO Jr. and HI-LO Models

HI-LO Jr. *with VISIBLE MIXING*

Carries up to 3 cu. yds. of mixed concrete on a single axle truck . . . and not exceed the single axle weight limitation of 18,000 pounds which prevails in many states.

NEW BULLETIN MAILED ON REQUEST

CONCRETE TRANSPORT MIXER CO.

Phone Flanders 7800

4989 FYLER AVE. • ST. LOUIS 9, MO.

Serving the CONCRETE-INDUSTRY 20 YEARS

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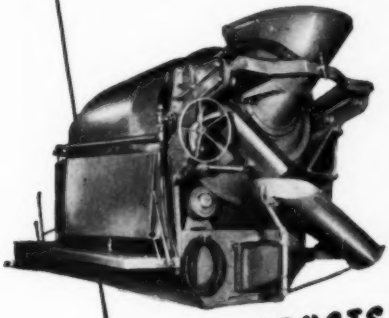
*See also Detailed Information in 1951 Pit and Quarry HANDBOOK and Concrete Industries Yearbook

TRANSO Announces THE NEW TRANSOMIXER

Patented and Patents Pending

TRANSO, A GREAT NAME IN MIXER DRIVES, NOW OFFERS A COMPLETE MIXER UNIT!

Transo's years of experience, gained in close cooperation with the trade, are engineered into the outstanding TRANSOMIXER. Know-how, that only results from years of successfully meeting the problems of the industry, makes this the best unit you've ever bolted on a chassis.



TRANSO PRODUCTS LAST & LAST!

JUST CHECK THESE FEATURES. **They're eight good reasons why you'll be seeing more and more TRANSOMIXERS on the road:**

1. Transo's Patented Direct Drive features a planetary type reverse transmission with a spring loaded clutch running in oil to eliminate shock loads. Fewer repairs and less costly down time are assured by directly coupling the drive to the drum through a large universal joint spider.
2. There are no COSTLY ring gears, sprockets, or chains to get out of commission.
3. From 800 to 1600 pounds of dead weight are eliminated by the patented Transo Direct Drive.
4. The TRANSOMIXER has an entirely new seal between the feed hopper and the drum. The seal is permanently leak-proof. Wear has been completely eliminated.
5. Another Transo feature incorporated in this new mixer is the two discharge and the two mixing speeds. Smooth starting and discharge reversing are inherent with the Transo direct drive.
6. The water pump is built-in, is very accessible, and has its own spring-loaded clutch. Like other Transo clutches it is self-adjusting.
7. TRANSOMIXERS are 12 to 17 inches shorter than competitive makes of the same capacity.
8. Designed to specifications of Truck Mixer Manufacturers Bureau.

Consider all these advantages and you'll choose TRANSOMIXER. WRITE for additional information and prices.

THE TRANSMISSION & GEAR CO.
10421 HAGGERTY AVE. • DEARBORN, MICH.

20 YEARS' EXPERIENCE WORKING WITH THE TRUCK MIXER INDUSTRY

Quadruples block and brick Sales

One of the oldest block manufacturers in the country, Dagostino Building Blocks started operations in 1919 under a tent on the same site, then covering only 500 square feet. Since installing their first Stearns 15 in their new plant last year, their sales have quadrupled, and the yard has grown to seven acres!

•

"Our plans for the near future include the installation of a second Stearns 15," say the enthusiastic owners of this sturdy, dependable, low-maintenance machine, rolling out the blocks . . . rolling in the profits. Father and sons, they are, left to right, Lawrence, foreman; Frank, maintenance foreman, and Andrew Dagostino, president of the 10-man concern.

PERFORMANCE IS PERFECTION—PERFECTION IS PROFIT!

MODERNIZE WITH A STEARNS! BACKED BY MORE THAN A QUARTER CENTURY OF KNOW-HOW!

STEARNS

MANUFACTURING COMPANY, INC

ADRIAN • MICHIGAN

5

DAGOSTINO BUILDING BLOCKS

1788 WATT STREET SCHENECTADY 4, N. Y.

Manufacturers of

Gravel and Cinder Blocks, Chimney Blocks and Flue Lining

All Sizes

Stearns Manufacturing Company
Adrian, Michigan

June 29, 1951

Gentlemen:

In December, 1949, we decided to buy the best high-production block machine on the market. Before buying, we toured the block manufacturing plants in the Eastern states and compared the quality, production capacity, and maintenance on all of the high-production machines.

On January 16, 1950, as you know, we ordered our Stearns 15, Magnetic Offbearer and Pallet Return, so our tour speaks for itself.

On March 1, 1950, our 15 started producing the squarest, strongest, and best block and brick ever turned out in this area, and as a result, we have quadrupled our sales.

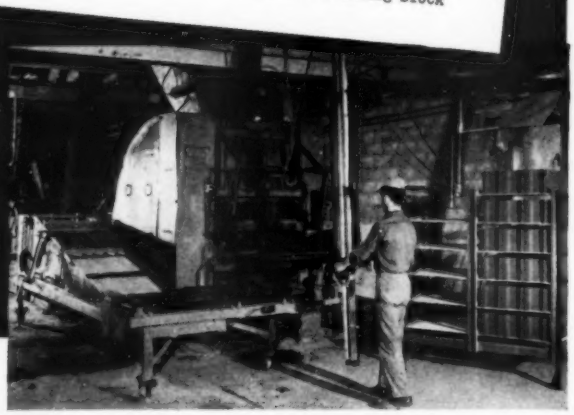
Our plans for the near future include the installation of a second Stearns 15.

We recommend Stearns equipment highly to all visiting block manufacturers for service, precision parts, and quality of equipment. Stearns is the Leader in its field.

Very truly yours

Andrew Dagostino

Andrew Dagostino
President
Dagostino Building Block



Dagostino's first, fully automatic, vibratory Stearns 15—"... the best high-production block machine on the market ... producing the squarest, strongest and best block and brick ever turned out in (the Schenectady) area." One-man. Plain pallets. 3-blocks-per-cycle—adjustable 4-6 cycles-per-minute. Power pallet handling. 20,000 lbs.

STEARNS 15 | STEARNS 50 | ZIPPERS | JOLTCRETES | MIXERS | SKIP LOADERS | TURNTABLES | SINTERLITE

ROLL ON TO PROFIT WITH UNIVERSAL

The most complete line of portable crushing, screening, washing and loading equipment for rock, gravel, aglime and concrete aggregates available. For big jobs, for small jobs, for any aggregate requirement buy Universal. See your Universal distributor or write for illustrated literature.

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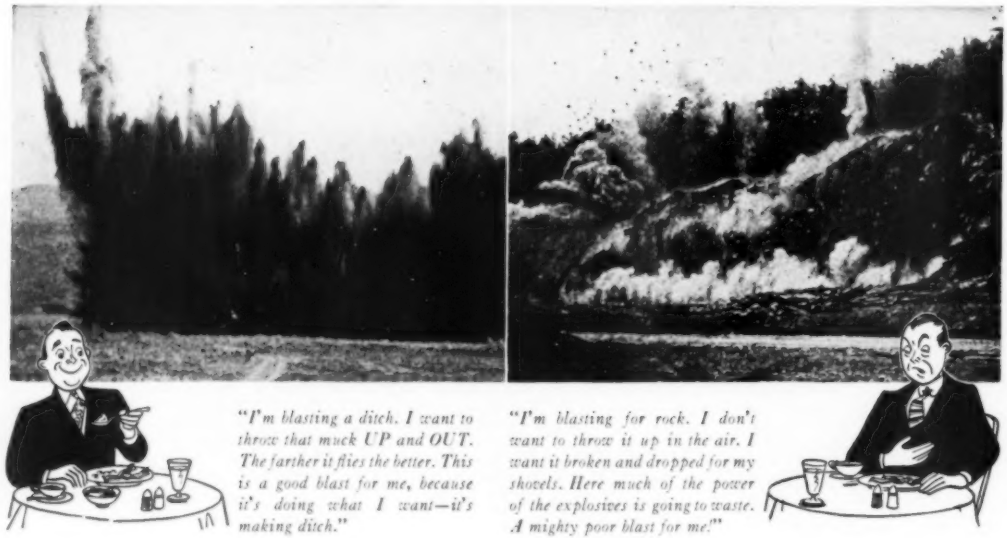
619 C Avenue N. W., Cedar Rapids, Iowa
Phone 7105

Division of PETTIBONE MULLIKEN CORPORATION
4700 West Division St., Chicago 51, Illinois
Phone SPaulding 2-9300

"One man's meat is another man's poison..."



"I'm blasting a ditch. I want to throw that muck UP and OUT. The farther it flies the better. This is a good blast for me, because it's doing what I want—it's making ditch."

"I'm blasting for rock. I don't want to throw it up in the air. I want it broken and dropped for my shovels. Here much of the power of the explosives is going to waste. A mighty poor blast for me!"

The blast that is just right for one operator may be all wrong for another. A ditching shot like the one at left above is meat for the farmer or agricultural engineer. But such throw is strictly poison for blasting work in quarries, strippings and most construction jobs.

The ROCKMASTER Blasting System gives better control over explosives force—enabling you to strike the proper balance between throw and breakage—to suit *your* job.

Your Atlas representative will be glad to help you use the proper combination of the 16 available ROCKMASTER split-second delay detonators, plus explosives and loading methods especially suited to your requirements.

Write today for the ROCKMASTER "16" booklet, showing typical loading diagrams for several types of quarrying, stripping and construction blasting operations. It's yours for the asking.

ROCKMASTER "16" TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

ROCKMASTER. Reg. U.S. Pat. Off.

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"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

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ASK THESE 10 QUESTIONS
before you buy a diesel engine!

1 Is it a "true" diesel?

2 Does it have unit fuel injection?

3 Does it have four valves per cylinder?

4 Does it have distortionless pistons?

5 Does it have interlocking rods?

6 Does it have an extra heavy crankshaft?

7 Does it have dual overhead camshafts?

8 Are the camshafts driven from the flywheel end?

9 Does it have an integral hydraulic servo-type governor?

10 Is the cylinder block symmetrical?

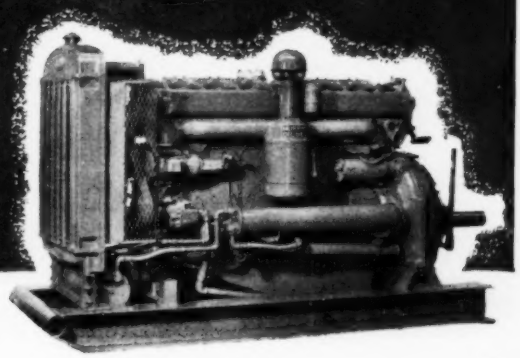
ASK these questions of any diesel engine salesman and you'll find that only the Murphy Diesel Salesman can answer "Yes" to all of them. From an operating standpoint ten "Yeses" mean you'll get more power, greater economy, greater dependability and longer engine life . . . just what you get with Murphy Diesels. Full information is given in the booklet *"10 Questions to Ask a Diesel Engine Salesman."* Ask your Murphy Diesel Dealer for a copy or write direct.

MURPHY DIESEL

Heavy duty power

for rock crushing

Murphy Diesel Engines and Power Units for portable or stationary crushing plants, 90 to 226 H. P. 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W.



MURPHY DIESEL COMPANY

5307 W. Burnham St. Milwaukee 14, Wis.

Sales, parts and service in principal centers

There IS something YOU can do ABOUT INFLATION!

Your future... the future of your business, large or small, depends on how many people understand the story in this booklet!
HOW STALIN HOPES WE WILL DESTROY AMERICA

Businessmen recognize ***inflation*** *as the nation's greatest single threat. But most of us have felt "What can one man—even one business—do to stop it?"*
But there is a way—if enough of us work at it. We can help more people . . . the men and women who work and vote and pay taxes . . . to understand the nature of inflation, its ***causes*** *and* ***cures****. Then we will have gone a long way toward eliminating this pending catastrophe.*

ONE TOOL YOU CAN USE: To help us give our own Bemis workers the inflation picture, we used the colorful, new 16-page booklet "How Stalin Hopes We Will Destroy America" produced by Pictorial Media, Inc. The more widely the booklet is used, the more good it will do . . . and it is available for distribution to your workers, too. It follows the time-proven "comic book" technique . . . dramatizes the dangers . . . and shows how all our citizens can help halt inflation before it's too late.

TESTS SHOW IT HELPS WORKERS: To get an impartial judgment of the value of "How Stalin Hopes We Will Destroy America," it was tested in Bemis plants by the Psychological Corporation under the direction of Dr. Henry C. Link, a foremost research authority. Dr. Link says "Those workers exposed to the booklet were found to have a significantly higher appreciation of the recommended ways to stop inflation than did the workers who did not see the booklet. Details of this test are available upon request." And Bemis factory workers make such statements as "Everything it says hit home, but you'd never figure it out for yourself until you read it". . . ."It's told in an interesting way so anyone can understand. My daughter, age ten, understood all of it". . ."In picture form it impresses you more. Most people don't read about it". . ."Had ideas that we wouldn't think about otherwise while we are working away—good book, agree with it—I guess I won't be the only one."

Because we believe this message is growing more urgent every day, Bemis is taking this means to commend to other businesses this weapon against inflation. It is the first of a series of such material that we expect to use.

BEMIS BRO. BAG CO.
St. Louis 2, Missouri

FOR EVERY BUSINESS, LARGE OR SMALL: In quantities, it costs only a few cents a copy—$10.00 for 100 copies, down to 3 cents per copy in larger quantities. Single copy free. For full information, write PICTORIAL MEDIA, INC., Attention: Paul Wheeler, 205 E. 42nd ST., NEW YORK 17, N.Y.

MORE JOBS, MORE PROFITS when you own a LIMA Paymaster

The LIMA PAYMASTER is a ¾ cu. yd. convertible shovel, crane, dragline and pullshovel designed and built for faster, smoother performance and more versatile application. Regardless of the type of work to be done you can be sure of maximum power, big output and low operating costs.

Ease of convertibility is one of the many "PAYMASTER" features that will enable you to handle a greater volume of work with more profit. Specifications and working ranges are given in bulletin #034-G. Write for a copy.

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LIMA-HAMILTON DIVISION
LIMA, OHIO

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BALDWIN-LIMA-HAMILTON

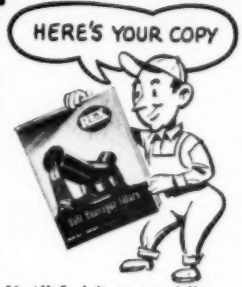
T2103

A LONGER RUN FOR YOUR MONEY!

Rex Idlers are built to last. Triple labyrinth grease seal . . . tapered roller bearings . . . extra large grease reservoir . . . these are a few of the Rex advantages that mean longer life for idlers, belts and machinery parts. Even if just one idler "freezes up," the belt can wear through the roll shell in a matter of hours, leaving knife-like edges to cut the belt. Rex Idlers are fully greased at the factory and will operate for long periods even without minimum maintenance. But Rex Idlers, or any other make, will give far longer service if minimum maintenance rules are followed. The fact that many Rex Idlers are still going strong after more than 25 years of service is, we believe, proof of the pudding.

Idlers, belts and machinery parts should be inspected periodically, depending upon amount of use. Greasing and servicing should be done as indicated by inspection. (Normally, 1000 operating hours is the average greasing period). Inspection should include the following checks:

1. All rolls turning freely and smoothly, with no excessive bearing end play.
2. All rolls properly seated in brackets.
3. No unusual damage to rolls, brackets or base.
4. Evidence of adequate greasing at seals but no excessive amount. Don't overgrease.
5. Check for accumulation of material under rolls. Keep deck plates clean.
6. No buildup of material on return rolls.
7. Grease pipes and fittings in good usable condition. No broken pipes or missing fittings.
8. Belt running true and self-aligning idlers operating freely.

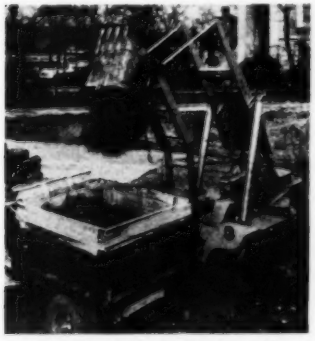


You'll find it pays to follow these tips. For more detailed information on idler care, approved idler greases, and for all the facts on the complete Chain Belt Idler line, send for Bulletin 51-81 Chain Belt Company, 1604 West Bruce Street, Milwaukee 4, Wis.

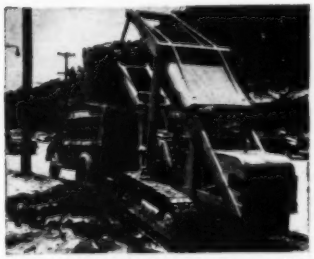
CHAIN BELT REX COMPANY

BELT CONVEYOR IDLERS

THE DEMPSTER-DIGGSTER, Type GRD, same as the one that loaded 600 tons of stone recently, has a 15 foot six inch turning radius, is 20 feet long when bucket is in traveling position, and bottom of bucket is nine feet three inches above ground when in extreme dumping position. It will dig 15 inches below grade and through a 15 foot bank.



THIS DEMPSTER-DIGGSTER, Type HL, is specially equipped for high dumping. The bottom of the bucket is 13 feet six inches above ground. It will dig through an 18 foot bank.



FOR FAST, EFFICIENT operation in difficult terrain, the Dempster-Diggster is available with crawler-type traction.

Fast Automotive Shovel Loads 600 Tons of Stone in Half a Day

CONTRACTOR REPORTS: HYDRAULIC CROWD, HOIST UNIT "FILLS LONG NEEDED PLACE IN OUR INDUSTRY"

THE DEMPSTER-DIGGSTER, a revolutionary shovel loader, recently loaded 600 tons of broken stone in the first half day of operation. This outstanding performance was reported to Dempster Brothers, Inc. by W. E. Lambert, president of Lambert Brothers, Inc., one of the nation's largest crushed stone contracting firms.

"In connection with our extensive activities in several southern states," the contractor said, "we have used various types of power shovels and front end loaders. After seeing the easy operation of the hydraulically operated Diggster in a demonstration we had made alongside of a competing loader, we placed an order with you. We installed the Diggster equipped with a yard and half stockpile bucket on one of our operations in western North Carolina.

"Our records show," he continued, "that the unit loaded approximately 600 tons of broken stone in the first half day of operation. The Diggster has been working continuously and is giving perfect satisfaction. It is a pleasure for us to so advise you because in our opinion the Diggster fills a long needed place in our industry. We welcome you to bring any interested parties to our operation to see the Diggster in action."

The tremendous speed of the Dempster-Diggster in excavation and stockpile work is accounted for, mainly, by its exclusive independent hydraulic crowd and hoist action, the hydraulic steering, and wheel-type traction, which permits truck speeds to and from jobs. The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver easy, fast, finger-tip control.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1¼ cubic yard (heaped) capacities; materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

Complete information and prices may be obtained by writing the manufacturer, Dempster Brothers, Inc.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS

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IS YOUR SHOVEL OPERATOR "POOPED" AT QUITTING TIME?

EASY-TO-RUN BAY CITY HELPS OPERATORS DO A BIGGER, BETTER DAY'S WORK

BAY CITY Shovels really cut operator fatigue with mechanical improvements that simplify operation and give smooth performance. The well-raised seat is comfortable. The cab design permits an unobstructed view for the operator. All controls are conveniently arranged within easy reach. Booster clutches permit fingertip control of front drum and hoist clutches with swift, positive action. The electric power dipper trip dumps quickly and easily. Anti-friction bearings and helical-cut gears insure quiet operation.

With a BAY CITY Shovel on the job, *your* operator will do a bigger and better day's work, too. For complete information see your nearest BAY CITY dealer or write us today.

BAY CITY SHOVELS, INC.,
BAY CITY, MICHIGAN

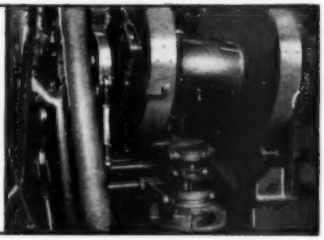
Diesel powered 1 yard Model 59 working for D. J. Carton Sand & Gravel Co. of Stratford, Conn.

191

CHECK LIST

- Fully Convertible
- Long, Wide Crawlers
- Alloy Cast Bases
- Tandem Drums
- Power Dipper Trip
- High Line Speeds
- Wide Vision Cabs
- Pin-Connected Boom

POWER BOOSTER CLUTCHES — The wide, heavy-duty hoist and front drum clutches are set with engine power by a mechanical type booster clutch that gives easy operation, simple adjustment and accurate load control. A short, easy throw of the operating hand lever sets the main clutches to permit fingertip control with fast, positive action.



BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

if you have a BIG SCALE cement slurry storage job

here's the unit you need...

Aerial view of South Dakota Cement Company's mill near Rapid City, S. D.; Type H Slurry Mixer in left foreground.

The Dorr Type H Slurry Mixer is the best answer to the problem of large volume kiln feed storage required in today's wet-process cement production. Here are several reasons why . . .

First, because it is powered by the Type H drive from which it takes its name . . . a rugged power-package incorporating balanced spur gears and extra-heavy duty construction.

Second, because it utilizes a center shaft mechanism with the drive head supported by a truss spanning the tank. This requires no center pier and foundation . . . saves concrete and reinforcing steel . . . greatly simplifies the construction of deep tanks as required for cement slurry mixing. In short—saves dollars for you.

Add to these features the thoroughly proven mixing control effected through the rake and air lift principle of the Dorr Slurry Mixer. The result is the best possible slurry storage unit in the 45′ to 70′ dia. range—at a reasonable installed cost. For more detailed information write to The Dorr Company, Stamford, Conn., or in Canada, The Dorr Company, 80 Richmond Street West, Toronto 1.

Better Tools TODAY for more tonnage tomorrow

DORRCO

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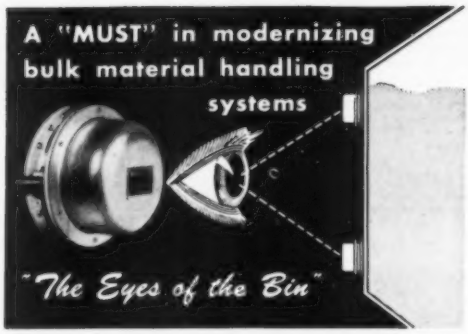
THE DORR COMPANY · ENGINEERS · STAMFORD, CONN.

Offices, Associated Companies or Representatives in the principal cities of the world



BIN-DICATOR BIN-LEVEL INDICATOR

BIN-DICATOR "keeps an eye" on levels of bulk materials in silos, hoppers, bins, chutes and automatically reports to central control point. Prevents over-filling; prevents overfeed and underfeed to conveyors and filling equipment; prevents delays and waste. Low cost, easy to install, simplest operation. Widely used.

BIN-FLO Aerator Units keep dry, finely ground materials moving in bins, hoppers, chutes; prevent packing and bridging.

NEW 20-PAGE BOOK FREE

THE BIN-DICATOR CO.
13946-T Kercheval • Detroit 15, Mich.

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BELT FASTENER No. 500

For Heavy Conveyor Belts of changing length

These heavy-duty belt fasteners make a strong, flexible joint in conveyor belts, belts of any width and of from 3/8" to 1/2" thickness. They offer special advantages in mines, quarries or industrial setups where length of position of belt is frequently changed, because sections can be removed or added at will. Joints are opened for this purpose by simply pulling out the hinge pin.

Easily and quickly applied on the job or in the shop. Special design gives deep compression into belting and smooth, flush joint.

Write for Circular.

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PIT AND QUARRY

Research Department

538 South Clark St., Chicago, Ill.

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- ☐ Drills, Diamond
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- ☐ Guns, Hydraulic
- ☐ Hardfacing Alloys
- ☐ Hoists
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- ☐ Hose, Air, Water
- ☐ Hose, Suction
- ☐ Hydrators, Lime
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- ☐ Kettles, Calcining
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- ☐ Kilns, Rotary
- ☐ Kilns, Vertical
- ☐ Lift Trucks
- ☐ Lime Putty Plants
- ☐ Lining, Kiln
- ☐ Loaders
- ☐ Loaders and Unloaders, Box Car
- ☐ Locomotives, Diesel
- ☐ Locomotives, Gasoline
- ☐ Locomotives, Steam
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- ☐ Meters, Water
- ☐ Mills, Ball
- ☐ Mills, Compartment
- ☐ Mills, Tube
- ☐ Mixers, Concrete
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- ☐ Motors, Electric
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- ☐ Nozzles
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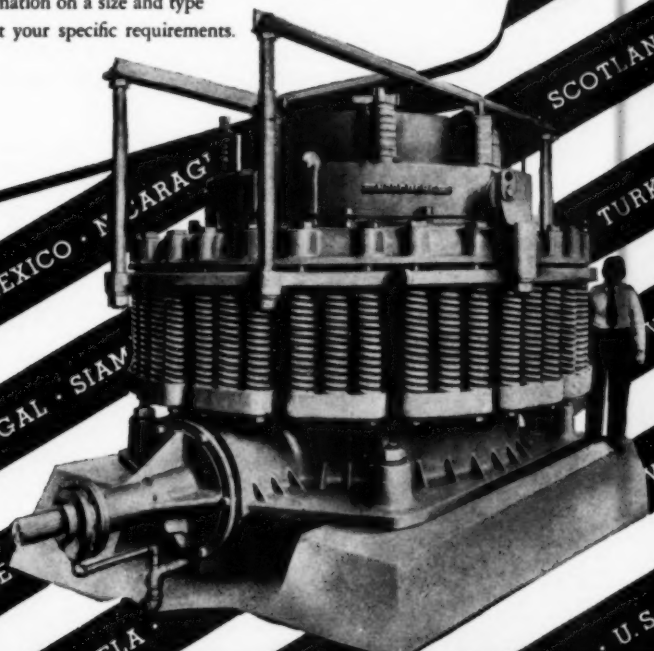

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Machinery for processing ores and industrial minerals

In this S-A engineered system S-A Belt Conveyors were designed for the job of handling bulk materials at lowest cost per ton. Processing costs reached new lows. This installation has a capacity of 300 tons of minus 10" gravel per hour —or equivalent volume of other materials. S-A engineers are able to draw on fifty years experience in designing such installations for fast, economical handling of rock products for all types of plants—large or small. *Write today!*

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50 years experience with bulk handling

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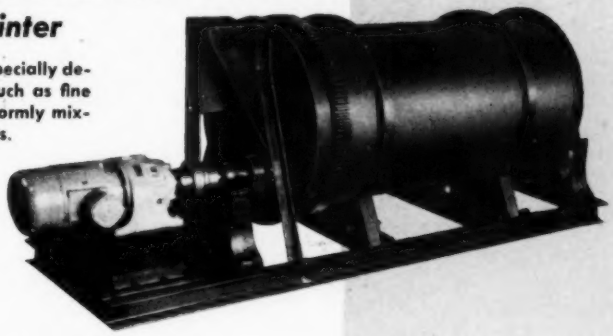

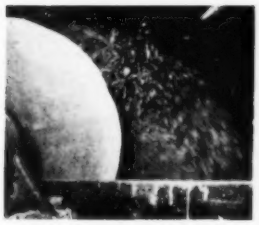

Shown at left is interior view of our SINTERITE Pelletizer Mixer in operation. Note the fluffing action, particularly suited to processing fine materials.

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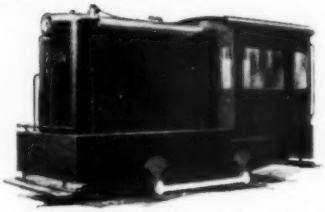

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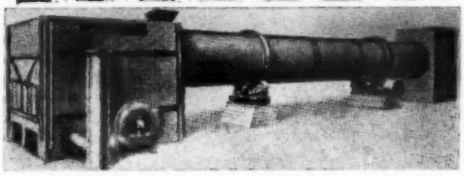

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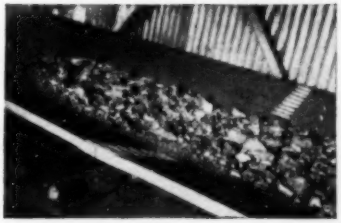

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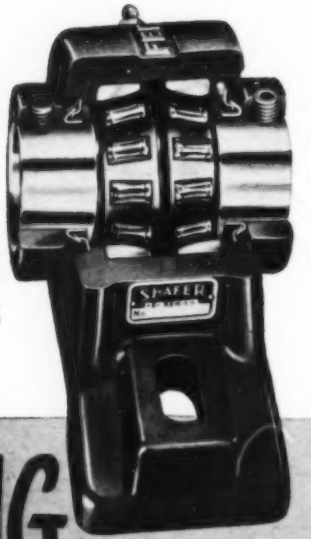

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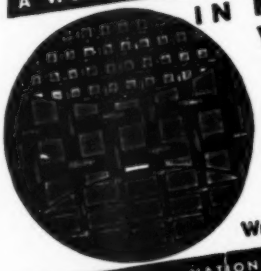

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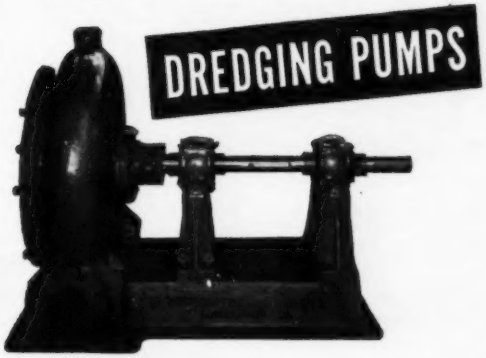

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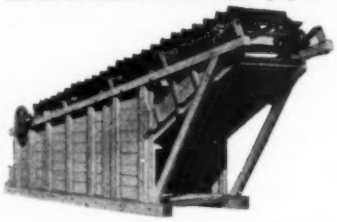

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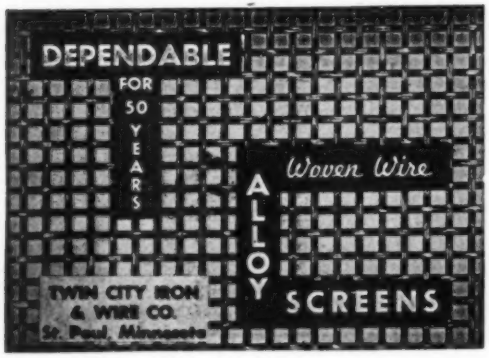

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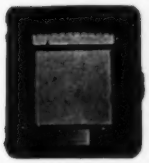

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SUPERINTENDENT FOR CRUSHING PLANT

Experienced, capable man to operate a large slag crushing plant, capacity 3,000 tons daily. Prefer man with at least ten years experience to be in full charge. Salary commensurate with ability and results in operating this plant which is a new installation. In reply, please give complete history as to age, health, education, background and experience.

Box No. 814, c/o Pit and Quarry Publications
538 South Clark St. Chicago 5, Ill.

POSITION VACANT

Graduate Chemist or Chemical Engineer with a minimum of 5 years experience in cement plant control work needed to be Chief Chemist for one of our cement plants in the Great Lakes Region.

Our company has experienced excellent profits, and we believe our salary schedule is considerably higher than the industry average.

This vacancy represents a real opportunity for the right man.

State age, experience, references, and salary requirements. Write Box No. 253, c/o Pit and Quarry, 538 S. Clark Street, Chicago 5, Illinois.

Our organization knows of this ad.

WANTED

Quarry superintendent, must take full charge, organize own men, experienced in drilling and shooting and setting up plants. Furnish references, age, salary expected and when available in first letter. Located in central Pennsylvania.

Box No. 912 c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

WANTED

Commercial stone quarry sites preferably located on railroad. Also interested in sand and gravel deposits. Give complete information.

Box No. 256, c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

POSITION VACANT

Young man with several years experience in the manufacturing end of the cement business is needed by a company having a wet process plant for opening as assistant superintendent. Submit full details concerning age, experience, and qualifications. Our Organization knows of this ad.

Box No. 911, c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

WANTED

Master mechanic familiar with stone quarry equipment. Steady work. State age, give references and when available in first letter. Located in central Pennsylvania.

Box No. 913 c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

WANTED

I-R Wood Borers, Drills, Paving Breakers, Jacks of all descriptions, Machine Bolts in quantities, Shackles of all descriptions, Ship Augers, Trench Braces, Wire Rope, Sheaves, Cable Clips, etc.

MAHONEY-CLARKE, INC.
217 Pearl Street, New York 38, N. Y.

WANTED

LIMESTONE KILNS or COMPLETE LIMESTONE PLANT

Need not be in operation. State full details including capacity.

Box No. 252, c/o Pit and Quarry
538 S. Clark St., Chicago 5, Illinois

EQUIPMENT WANTED
NEW OR USED

Bucket Elevator, approximately 60' center to center chain sprockets, with 14" x 8" type SC buckets at 18" center on single strand chain.
Heavy Duty Pan or Apron Conveyor, approximately 14' to 16' long, and 24" wide.
Track Hopper, approximately 8' x 8', for use with above Pan or Apron Conveyor.
Reply to: **Mr. R. B. De Lisle**
General Purchasing Agent
Pittsburgh Metallurgical Co., Inc.
P. O. Box 636
Niagara Falls, N. Y.

WANTED

36"gauge—8 to 10 ton Gasoline Locomotive

WARNER COMPANY
BELLEFONTE, PENNA.

L.B.SMITH INC. OFFERS

AIR COMPRESSORS

Ingersoll-Rand 105 cubic foot on 2 pneumatics. Good condition.

Schramm 105 cu. ft. gas powered compressor on 4 steel wheels.

Gardner-Denver two-stage 160 ft., skid mounted.

Worthington 210 cubic foot, two-stage air-cooled, on skid base with Hercules diesel.

Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven, 50 HP slip ring motor.

Worthington two-stage, water cooled, vertical 250 #.-60 CFM, new condition.

BELT CONVEYORS & BELT

New 18" — 24" — 30" — 36"

SHOVELS & CRANES

Bucyrus-Erie 37B shovel-crane combination, diesel powered.

Lorain 50, 1-yard diesel. New.

Lorain 55 clam-crane, 50' boom.

Brownhoist 1-yd. gas shovel and crane.

Lorain 30 combination ½-yd. shovel, hoe & clam.

Universal truck crane.

WELL DRILLS & TOOLS

Sanderson-Cyclone #42 well drill, new.

Sanderson-Cyclone #44 well drill, new.

Sanderson-Cyclone #40 well drill with drilling tools, excellent condition. Mtd. on K-5 International chassis.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

QUARRY EQUIPMENT & BINS

Cedarapids 2036 AAA unit with feeder, etc.
Cedarapids Jr. Tandem roll & jaw unit.
3033 Cedarapids hammermill, rebuilt.
10 x 7 Allis Chalmers Blake type jaw crusher.
Cedarapids No. 1 Kubit
80 ton 2 compartment storage bin with clam shell gates.
4' x 12' Tyler Niagara type 600, 3 deck.
4' x 6' Kennedy Van Saun single deck.
4' x 6' Kennedy Van Saun double deck.

MISCELLANEOUS

Barber-Greene 44C Trenching Machine.
Austin Western 77 tandem drive grader, 12' blade, scarifier.
½-yd. to 2-yd. clamshell buckets.
½-yd. to 5-yd. dragline buckets.
6-yd. and 12-yd. Sauerman buckets.

TRUCKS — TRAILERS

1½-ton Ford & Chevrolet.
2½-ton GMC, New and rebuilt.
2,000 gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.

GASOLINE AND DIESEL ENGINES

New and used Murphy 4-cylinder diesel.
GMC 6 and 12 cylinder. Practically new.
Buda, Hercules, Hill, rebuilt.

Phone HARRISBURG, PA. 7-3431

L.B.SMITH INC. CAMP HILL, PA. SUBURB OF HARRISBURG

WE OWN THE EQUIPMENT WE ADVERTISE

WANTED

Dryer 6 to 7 ft. Diameter, 40 to 50 ft. long.

Also,

O.E.T. Crane 24 to 30 ft. span—5 to 15 ton capacity for clam-shell operation—3 phase, 60 cycle, 440 volts, cab controlled.

SILICA PRODUCTS CO., INC.
Guion, Arkansas

WANTED TO BUY

Gravel Pit located in Illinois. Kindly give full particulars.

Write to Box No. 251, c/o Pit and Quarry Publications
538 So. Clark St. Chicago 5, Ill.

WANTED

DIESEL-ELECTRIC Generator from 75 KVA to 100 KVA.
MINE HOISTS—one diesel & one electric, cap. 10,000 lb. single line pull.
PRIMARY JAW handle 18" rock, set of double rolls, ball mill, or hammermill to reduce to 1/16" and less.
PORTABLE COMPRESSOR, 210 ft. or larger with 2 rockdrills, wet drilling.
For mine set-up in Arizona
M. Wenzel, 2136 Jefferson, Kansas City, Mo.

WANTED

One—4 cu. yd. Stationary Concrete Mixer with electric motor for 220 V 3 ph-60 cyc, non-tilting preferred. Please send all data, location, condition, etc.

MAHONEY-CLARKE, INC.
217 Pearl Street New York 38, N. Y.

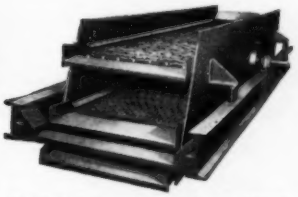
SCALES—CRUSHERS—VIBRATING SCREENS CONVEYORS — FEEDERS — IDLERS

GUARANTEED EQUIPMENT — IMMEDIATE SHIPMENT

CINDER, PUMICE, PERLITE CRUSHERS

10 to 20 tons per hour capacity....$ 479.00
25 to 50 tons per hour capacity.... 1144.00
Complete with hopper.

VIBRATING SCREENS



Heavy duty eccentric shaft types. One to five decks. Screening sizes from 3'x8' to 5'x14'. Priced from.....$1573.00

CONVEYORS — PICKING TABLES

Troughing idler conveyors—picking tables. Any length, belt widths to 60".
Prices from $450.00

Flat belt type bulk material conveyors. Any length, belt widths to 48".
Prices from $726.00

Build your own conveyors; we have standard sections, head and tail pulleys, take-ups, drives, idlers, speed reducers, sheaves, belting etc.

TRUCK SCALES

15 Ton Truck Scales.....$545.00
20 Ton Truck Scales..... 617.00
26 Ton Truck Scales..... 684.00

Others to 50 ton capacity. All scales complete with structural steel weighbridge. Parts and weighing beams for most makes of motor truck scales.

More than 3000 mines and quarries have modernized with Bonded equipment.

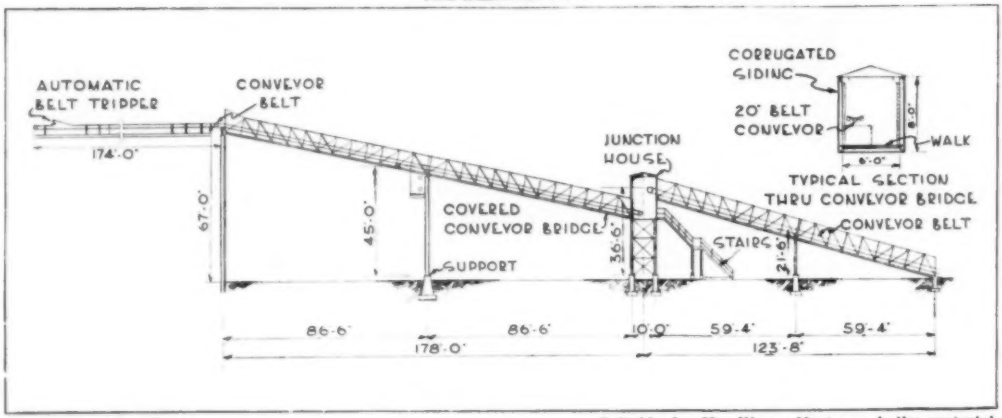
BONDED SCALE AND MACHINE COMPANY
PHONES: GArfield 2186; FRanklin 6-8898, Evenings.
110 Bellview Columbus 7, Ohio

FOR SALE

LINK-BELT 20" BELT CONVEYOR

COMPLETE WITH BELTS, DRIVES, ROLLERS & OTHER EQUIPMENT

AS ILLUSTRATED



Condition:- Excellent

Rated Capacity:- Over 4,000 cu. ft. per hour

Suitable for Handling:- Most any bulky material

Coal	Gravel	Ores
Coke	Sand	Dirt
		Grain

This conveyor is supported by truss work and is completely enclosed. A walkway is provided in the enclosure alongside the conveyor.

PHONE—WIRE—WRITE

GLAZER STEEL CORPORATION

KNOXVILLE, TENNESSEE PHONE 4-8601

SPECIAL OFFERING

1—new 18 x 32 solid steel frame style D crusher.

1—new 14 x 26 solid steel frame jaw crusher.

1—#6 McCully crusher in good running condition just taken from service.

2—6' dia. 12 x 16' long scalping screens 2¼" manganese perforations.

A number of new manganese steel screen sections for Allis Chalmers 6' revolving screens 2¼" perforations.

New and rebuilt jaw crushers in all sizes from 6 x 10 to 42 x 60.

ACME ROAD MACHINERY COMPANY — Frankfort, New York

BETTER BUY NOW!

TRACTORS

International "TD-14" Used Diesel Tractor w/B-E Dozer
Bulldozer attachment — only — for Int. TD-14 Tractor w/DD PCU
LaPlant-Choate "C-44" **New** 4 yd. Hydraulic Scraper. Discount

CRANES & SHOVELS

Northwest "25" ¾ yd. Used Diesel Dragline, 40' Boom
Quick-Way "J" ½ yd. Hoe or Dragline, mounted on White Half Truck
Shovel Attachment only — for Unit "514"
Erie ¼ yd. New Clam Bucket
Erie ⅜ yd. New Clam Bucket
Wellman "12M" ½ yd. New Clam Bucket

MISCELLANEOUS

Rex "27E" Paver. Big Drum. Ready to pave
Rex "34E" New Paver. Dual Drum. Mechanical Man Controls
LeRoi "315" Diesel Compressor, 1100 hours, Pneumatics

EIGHMY EQUIPMENT COMPANY
120 S. Pierpont Rockford, Ill.
(US No. 20 West)

CRANES

½ and ¾

Insleys — Buckeye — Byers — Units — Osgood P. and H. — Lorain — Lima.

(As is) or reconditioned.

½ to 2 Cu. Yd.—
Drag & Clamshell Buckets
Wrecking 1000 GI Trucks

THE ELLIS COMPANY
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RUBBER CONVEYOR BELTING

At Lower Prices

Top Quality — Immediate Delivery

Width	Ply	Top-Bottom	Covers
18"	4	1/8"	1/32"
20"	4	1/8"	1/32"
20"	5	1/8"	1/32"
24"	4	1/8"	1/32"
24"	5	1/8"	1/32"
28"	5	1/8"	1/32"
30"	5	1/8"	1/16"
30"	6	1/8"	1/16"

And Other Sizes

TRANSMISSION BELTING
AIR HOSE (All sizes)
SUCTION & DISCHARGE HOSE
WATER HOSE
V BELTS
Also Mill Remnants

Write or wire collect for samples & prices

E. D. HEEHS & SON
1285 Hollywood Ave. • Memphis, Tenn.

CLYDE HYDRATOR WITH KUNTZ CONTINUOUS DUSTLESS SYSTEM, 4-5 T.P.H.
#0 RAYMOND AUTO PULVERIZER WITH THROWOUT, SEPARATOR & CYCLONE.
HERCULES JR. 3 ROLL PULVERIZER
24 x 18 A JEFFREY HAMMER MILL.
6' x 22" HARDINGE DRY BALL MILL.
KUNTZ 5 x 20 CONTINUOUS HYDRATOR.
#4 CLYDE BATCH HYDRATOR.

GANTRY & O.E.T. CRANES

10 TON P & H—80' SPAN.
3—5 TON NILES SHEP. 32'8" SPAN.
45 TON CLYDE 85' BOOM, GANTRY.
50 TON AMER. 120' BOOM GANTRY.
DARIEN, 60 E. 42nd St., N. Y. 17, N. Y.

TRUCK MIXER FLEET FOR RENTAL OR SALE

90% of this fleet 1949-1950 and 1951 models LF and LJ 10 wheel Mack Trucks. Mixers are Jaeger and Rex 4½ and 5½ high discharge and horizontals, most of which are 49's, 50's and 51's. Some of this equipment can be purchased on rental-purchase plan. Most of it now available for immediate delivery.

SPECIAL: 2—365 CFM compressors, 1950 models attractively priced.

Rental Mixer Corporation

127-04 Northern Blvd., Corona, L. I., New York

NEwtown 9-7777

FOR SALE

Symons 42"x14' 1½ deck vibrating screen
Simplicity 6'x8' vibrating scalping screen
Leahy single deck 4'x8' vibrating screen
Seco single deck 4'x6' vibrating screen
Robins "VIBREX" single deck 42"x60" screen
"PLAT-O" three deck 3'x6' vibrating screen
Six new Universal vibrating screens
Revolving screen 4'x20'
Two roll crusher, 18"x28", heavy duty
Buchanan "B" 10"x16" jaw crusher
Reliance portable 11"x22" jaw crusher
Good Roads jaw crusher 10"x20"
Schutz-O'Neill mill pigment pulverizer
Dellinger 246 hammermill and dust collector
Gruendler 16-40 Artstocrat-Peerless Grinder
Gyratory and jaw crushers
Jeffrey-Traylor 2-A vibrating feeder
Link Belt 24" wide 17' apron feeder
Continuous and spaced bucket elevators
Elevators with 4" to 16" malleable buckets
Enclosed 40' elevator with 16"x8" buckets
Open elevator 40' center, 10" buckets on chain
Open elevator 40' center, 8"x5" buckets on belt
Open elevator 30', 12"x7" buckets on 14" belt
Elevator belt, chain, sprockets, buckets, drives
Gravity roller conveyors, 8" to 20" wide
Slat conveyor 30" wide, 50' long
93 feet new belt with 51 stainless steel 6" buckets
New belt conveyors 18" and 24"
30", 36", and 42" belt conveyors and parts
Reducers, electric motors and gasoline engines
Flat and V pulleys, sprockets, gears to 60" dia.
Eccentric roller bearings 2-15/16"
Gears, sprockets, chain and drives
Three 18" belt conveyors with steel frames
2400 ft. 1260' chain, DI RH and LH links
Frederick 14" pump, 7500g. 200' head
I.R. 6"x6" pump, 1000g. 288' head
I.R. 8"x6" pump, 2000g. 188' head
12" screw conveyor sections
50,000 feet elevator, drive and drag chain

G. A. UNVERZAGT & SONS
136 Colt St. Irvington, N. J.

Available Immediately — Subject to Prior Sale

AIR COMPRESSOR
Jaeger 75
Worthington 160
LeRoi 210
Ingersoll-Rand 315

BUCKETS
Haiss ½ yd. clam
BK ⅝ clam
Heinecke ¾ yd. clam
Kelsler 1 yd. clam
Wellman ⅝ yd. drag
Hendrix ⅝ drag
Page ¾ yd. RC drag
Hendrix 2½ yd. HD drag
Concrete buckets ½-⅝-1 yd.

CRANES
P & H 600
Insley K-12
Lima 34
P & H 150
Bucyrus-Erie 103S
Bucyrus-Erie 10B
Insley K-12 shovel front
Insley K-12 hoe attachment
P & H 150 shovel front
P & H 150 hoe attachment
Lima 602 shovel attachment
35' boom for Koehring 376
Lima 34 hoe attachment

GRADERS
Gallon 104
Gallon 118
Caterpillar 10
Gallon 1HC
A.C. "W" Patrol

LOADERS
Burch car unloader
Austin-Western
Haiss 75 W
General crawler
Scoopmobile

PAVERS
Adnun black top
Foote 27E

ROLLERS
Gallon 10 ton 3 wheel
C. H. & E. 2-3 ton

TRACTORS
A.C. HD7 w/Baker blade
A.C. HD10 w/GW blade
Int. TD-14 w/BE blade

MISCELLANEOUS
Highway Spreader
Rud-o-matic Taglines
Cleaver Brooks Tankcar Heater
10-T Stiff Leg Derrick
125 ft. 24" Conveyor
2-D American 55 H.P.
C. H. & E. Saw Rigs
Cleveland Wagon Drill
G-D Wagon Drill
Pumps all sizes
McKiernan-Terry 83 hammer
Jaeger Truckmixer 2HC

REID HOLCOMB COMPANY, INC.

1815 Kentucky Ave. Phone: Market 4433 Indianapolis, Ind.

SALE OR RENT

1—15 Ton Std. Ga. Diesel Loco.
1—⅝ Lorain 41 Comb. S & D 1948
1—⅝ Northwest 25 Gas as Shoe.
1—Koehring 304 Truck Crane
2—10 Ton all steel Guy & Stiff Leg Derricks
1—Michigan Crane, Hoe, & Shovel mounted on 10-Wheel carrier
1—45' Crane Boom for Link Belt L800
1—2 yd. Link Belt K370 Dragline
1—2½ yd. N W 80D Shovel
1—40 Ton Industrial Oil Fired Loco. Crane 1943
1—65 Ton 0-6-0 Saddle Tank Loco. 1943
1—801 Koehring Shovel & Crane
6—50 Ton all steel Gondolas
1—D8 2U Series Bulldozer

B. M. WEISS CO.
Girard Trust Co. Bldg.
Philadelphia 2, Pa.
Rittenhouse 6-2311

FOR SALE

1—Cedarapids CCC 4024 Roll Crusher unit complete with Model ME-650 Murphy Diesel Engine.

Used less than 4 months.

Attractive price for quick sale. Phone or write:

Syracuse Supply Co.
294 Ainsley Dr.
Syracuse, N. Y. Tel. 4-3157

DRYER OR KILN: Allis Chalmers 10 ft. x 90 ft., heavy duty, plate thickness 22.95 lbs. per sq. ft., complete and with or without coal fired Furnace, Western Precipitation Dust Collector, Clarage #41 Exhauster, Motors, Control equipment, etc.
1—90" x 60 ft., single shell, new condition.
1—6' x 44' Kiln and 1—4' x 46' Cooler, both with or without all auxiliary equipment.

COMPRESSOR: Worthington 2 stage, 29/18-½ x 21, 600 H.P. synchonous motor, 3 phase, 60 cycle, 440 volt, 180 RPM, cap. 3000 CFM, 100 lbs. pressure, complete with auxiliary equipment. In operation now, available immediately.

LOG WASHER: 25 ft., heavy duty type, with 2 logs, 6" x 6" x ⅝" angles, complete, ready to operate.

CLASSIFIER, Wemco, Simplex, 78" x 28½ ft. New condition.

BOOT BUCKET ELEVATORS: 2—63 ft. ea. manganese steel chain, buckets 16" wide.

SCREW CONVEYOR: 12" x 22 ft. with center bearing, 87 RPM, capacity 30 TPH.

BIT DRESSER: Bucyrus Erie model 12 for bit 6" to 12". This is a complete forge shop with furnaces, jib crane, 500 lb. air hoists, all auxiliary equipment and portable steel building 36 x 36 with cupola.

BLAST HOLE DRILL: Bucyrus Erie 27-T, diesel, 6⅝" bits.

WAGON DRILL: Ingersoll Rand type D with X71 WD Drifter for 1¼" steel, with D-6-U hoist, mounted on steel wheels.

TRUCKS: Euclid 15 yd., model T, end dump, 22 ton capacity, 275 H.P. Cummins motors.

DIESEL MOTOR: 122 H.P. Caterpillar D13000 complete with clutch, V-belt pulley and spare parts.

BOILERS: 1—Erie City 150 H.P., ASME, return tubular, 4" tubes, 150 lbs. working pressure, pin hole grates and all fittings. 2—220 H.P., 160 lbs. pressure, National Board, 3 drum, low head, complete.

CRAWLER CRANE: Electric 1¾ yd. capacity, 60 ft. boom, Ward-Leonard control, excellent condition. A real bargain. 1—Lima 1001 and 1—Speed Crane model 3000 with 75' boom, long cats.

STEAM SHOVEL & CRANE: Bucyrus Erie model 50-B, ASME oil fired boiler, 65 ft. boom.

DRAG SCRAPERS: 1—Sauerman 2 yd. Drag Scraper outfit, complete without 75 H.P. motor. 1—Sauerman ¾ yd. capacity complete with 30 H.P. motor. 1—Sauerman 1½ yd. capacity complete with 60 H.P. motor.

BRIQUETTING PRESS: Capacity 18 tons per hour, 33" dia. rolls.

MINE HOISTS: Single and double drum 150 H.P. to 1500 H.P.

CRUSHERS, GYRATORY: Various makes, size 12" x 44" to 42" x 134".

CRUSHERS, JAW: Various makes, 12" x 15" to 48" x 60".

CRUSHERS, REDUCTION: Symons 2 ft. Cone, standard bowl. Telsmith 2 ft. and 3 ft. Gyrasphere. Traylor 4 ft., type TY.

COAL CRUSHER: Jeffrey Flextooth size 24 x 42", steel frame.

FEEDERS: Syntron F5-500 Vibratory Grizzly, 48" x 10'11", with four vibrators. NEW condition. Manganese Apron Feeder 44" x 16 ft. complete, NEW condition.

LOCOMOTIVES: 3—50 Ton Std. gauge saddle tank Locomotives, National Board Boilers. Excellent condition.

A. J. O'NEILL
Lansdowne, Pa.
Phila. Phones: Madison 3-8300—3-8301

FOR SALE

CRUSHER—15 x 40 Champion Jaw Crusher.
SCREEN—4 x 12 Triple Deck Telsmith vibrating 2 years old.
TRUCK SCALE—Howe 24 ton, 9' x 26' platform.

G. & W. H. CORSON, INC.
Plymouth Meeting, Pa.

FOR SALE

Allen Billmyre, Model 20-1400 Centrifugal Turbo Compressor with 30" Rockwell Butterfly Valve, rated at 14,000 C.F.M. of standard air against pressure of 2 P.S.I.

200 H.P., 1800 R.P.M., 3 phase, 60 cycle, 440 volt, frame 116S, open ball bearing Louis Allis Motor. @ $1953.00

Cutler Hammer, size 5, Auto Transformer Type Starter in Nema 1 enclosure, 440 volt, #9621-H-360. @ $1265.00

Bonded Scale Cinder Crusher #1216-C, 12" x 16" complete with hopper, corrugated rolls, 5 H.P., 220/440 volt, 3 phase, 60 cycle, motor V-Belt Drive. @ $ 697.00

Bonded Scale Coal Crusher #2836-C, 28" x 36" complete with hopper, toothed rolls, 40 H.P., 220/440 volt, 3 phase, 60 cycle motor, V-belt Drive. @ $4631.60

Day Ro-Ball #82 stabilized Gyrating Screen with two 40" x 120" screen surfaces with ½ x ¾ mesh steel wire cloth, galvanized iron bottom pan, wood top cover, mounted on standard low channel iron supporting frame and driven with 3 H.P., 3 phase, 60 cycle, 220/440 volt, totally enclosed motor, cog belt drive. @ $1980.00

(80) 10" x 6" Malleable Iron, style A, Buckets—Link Belt. @ $1.95 each

These items are new, have never been used, and are priced below the market.

STEARNS MANUFACTURING COMPANY, INC.
ADRIAN, MICHIGAN

FOR SALE

LOCOMOTIVES

2—Brookville 3 Ton Gas—S.G.
2—Plymouth 6 Ton Gas—36" Ga.
3—Whitcomb 15 Ton Diesel—36" Ga.
1—Davenport 10 Ton Diesel—36" Ga.
1—Brookville 10 Ton Diesel—30" Ga.
1—Plymouth 70 Ton Propane—Electric—S.G.

LOCOMOTIVE CRANES

1—Ohio 30 Ton Coal Fired.
1—Ohio 25 Ton Coal Fired.
1—Burro #10 2½ Ton—Gas.
1—Burro #15 5½ Ton—Gas.
1—American R-10 Whirley-3-60-440

CARS

40—15 Ton Hopper—36" Ga.
2—50 Ton Hopper—Cross Dump—S.G.

MISCELLANEOUS

2—American 3 Drum Gas Hoists with Swinger—185 HP.
1—Flory D.D. Elec. Slope Hoist 150 HP.
1—W.S.M. Mine Hoist D.D. 700 HP. 3-60-2200.
2—Conway 75 Muckers—#256 & 305.

R. H. BOYER
2005-13 W. Bellevue St. Philadelphia 40, Pa.
Phone SA. 2-7132.

CONVEYORS

Belt, Bucket, Drag or Gravity
Shaker & Vibrating Screens
Truck Scales **Crushers**
Coal Drills **Mine Fans**
Car Spotters & Hoists
Electric Motors — Floor Cranes
Mining and Stripping Equipment

WHAT DO YOU NEED?
THE INDUSTRIAL EQUIPMENT CORP.
910 First National Bank Bldg., Atlantic 1-2929
Pittsburgh 22, Pennsylvania

JAW CRUSHERS

6" x 3" to 60" x 48"

Before buying or selling **any** FARREL-BACON JAW CRUSHERS it will pay you to consult

BACON-PIETSCH Co., Inc.
149 Bway.—N. Y. City—Di. 9-3620
Engineers & Manufacturers

Machine Shop Facilities

FEEDERS, Conveyors, Screens, etc.

Send for Catalogue

FOR SALE

1201 Lima Standard Shovel, with air controls, 32' 6" boom, 22' stick, 3½ yd. dipper, 18' 11" crawlers, 44" treads and 6 cyl., Type "L" Cummins diesel engine. 1950 machine; worked only 6 months. Excellent condition.

Loomis #44 Clipper Well Drills, with 40' all steel masts; Continental gas engines. Excellent condition.

Frank Swabb Equipment Co., Inc.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. Telephone 4910

FOR SALE

1—70 HP Marine type diesel Engine
Link Belt Pan Conveyor 36"x22' Centers
Fuller clinker cooling equipment for 10' kiln
2—Clam shell buckets

OLLIE E. LAWRENCE
P.O. Box 688 Quincy, Michigan

FOR SALE

1—Sauerman, 1 cu. yd. Drag Scraper Machine, complete with Diesel driven 3 drum roller bearing hoist, 45 ft. head tower and all necessary fittings. Purchased new 1947. Used very little.

TRI-COUNTY BRICK CO.
P. O. Box No. 7 Wood-Ridge, N. J.

RELAYING RAIL

All Sizes
Track Accessories

LEFTON INDUSTRIAL CORP.
General Office: 212 Victor Street
St. Louis 4, Missouri

FOR SALE

8" dredge including Morris pump driven thru V-belts by Cummins Engine and mounted on 19' by 27' steel barge. Price $7500.00 F.O.B. our plant. Write or call:

SPICER GRAVEL COMPANY
445 Union Street, Marseilles, Illinois

ACME BARGAINS

Haiss "Model 75" Crawler Gas Bucket Loader.

Byers "83" ¾-yd. Crawler Dragline, new 1946, 40-ft. boom, Buda Gas Engine.

P&H "100" ¾-yd. Crawler Crane, Dragline and Shovel, completely rebuilt.

Barber-Greene Crawler Gas Disc Type Bucket Loader.

The above priced to sell.

THE ACME EQUIPMENT COMPANY
14057 Schaefer Highway, Detroit 27, Mich.
VErmont 7-0366

FOR SALE

45 ton Plymouth diesel loco. new '42
25 ton Browning loco. crane new '41
5 yd. Koppel quarry cars 56½" ga.
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3000 ft. Ingersoll-Rand compressors
8¼x10 Clyde 3 drum hoist. New
20 ton Bay City motor truck crane new '49
5 ton Steel stiffleg derrick. New
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COMPLETE CONCRETE BLOCK PLANT and equipment.
WASHING and CRUSHING EQUIPMENT complete with necessary motors and drives.
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3—15 ton Whitcomb gas Loco. Std. gauge.
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3—Bay City Tractor Shovels, Hoes or Cranes, "Pups" ⅜ yd., ¾ swing. Crawler mounted, gasoline driven.
1—Quickway Truck Crane, Hoe & Shovel, Model "E", 4/10th cu. yd., new 1948, used little, mounted on Federal 6x6 Truck Chassis, on 10 - 10:00x22" tires, dual rear drive and front drive, powered by Hercules HXC, 779 cu. in. gasoline engine. In excellent condition. A real buy.
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2—Bay City, Model 15, Truck Cranes, 35 ft. Booms, Hoes and Shovels, mounted on A.C. Mack Chassis.
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628 Ft. Worthington 15&9½x12 Belted.
659 Ft. Worthington 15&½x12, 125 H.P.
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3—Roll Hercules Junior Pulverizer.
3—Cedar Rapids 40 In. Hammer Mills.
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5'x22", 6'x22", 6'x48", 8'x22" & 8'x36" Hardinge Conical Ball Mills.
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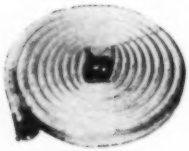

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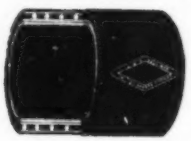

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200,000-100,000-50,000 Gal. Tanks-Towers
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1—420'x20" SA Comb. Scraper & Bucket Conveyor or w/o MT'r. Ideal for tipple or dock.
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1—848 Barber Greene Pugmill Mixer Complete
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10"x36" roller bearing, primary jaw crusher, 40"x22" roller bearing roll crusher, 4'x12' double deck vibrating screen, troughing rolls, return rolls, head and tail pulleys, conveyors.... ..... $18,500.00

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1 Compressor, Sullivan Twin Angle Compound, 2 stage 20x12x14 Complete with air receiver, after cooler, valves, etc., General Electric Co. Synchronous Motor, 450 HP 440 volts and Magnetic Controller. Displacement 2800 CFM; Actual Delivery 2366 CFM.
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1 Hammer Mill, Jeffrey 42"x36"
Motors, 1 to 500 HP and larger
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Special—Washing and Crushing plant, 100 t.p.h. capacity, Cedar Rapids & Pioneer units

Diamond 24x36 crusher	Lorain 40 shovel and dragline	Simplicity 2x6 screen
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These machines reconditioned in our newly-built daylight plant. Come see them!

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10′ x 15′ straight side, 10′ cone.
7′8″ x 11′6″ x 17′3″ (2).
8′ x 8′ x 14′ with U bottom (2).
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23′ centers, 8″ x 5″ buckets (2).
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40′ centers, 4″ x 6″ buckets.

CLASSIFIER

Dorr, duplex, 4′ x 20′.
30″ x 15′ FLIGHT Separator.

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104′ centers, 14″ belt, troughing.
24′ centers, 14″ belt, troughing.
13′ centers, 14″ belt, troughing.
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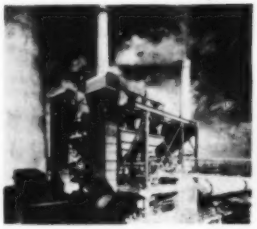

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